

All clearly demonstrated from Principles of Reason, Ingenuity, and late but most Real Experiences ; and held forth at an Inconsiderable charge to the Profits accrewing thereby, under

Adams 7. 65. 12

Six Peeces of Improvement.

- 1 By Floting and Watering such Land as lieth capeable thereof.
- 2 By drayning Fen, Reducing Bog, and Regaining Sea-lands.
- 3 By such Enclosures as prevents Depopulation , & advanceth all Interests.
- 4 By Tillage of some Land lost for want of, and Pasturing others destroyed with Plowing.
- 5 By a Discovery of all Soyles and Composts with their nature and use.
- 6 By doubling the growth of Wood by a new Plantation.

The Third Impression much Augmented.

With an Additionall Discovery of the severall Toolles, and Instruments in their Formes and Figures promised.

With a Second Part ; Containing

Six Newer Peeces of Improvement.

- 1 Our English Husbandring Claver grasse, and St. Foyn, as high as may be.
- 2 The facilitating the charge and burthen of the Plough, with divers Figures thereof.
- 3 The Planting Welde, Woad, and Madder, three rich commodities for Dyers.
- 4 The Planting of Hops, Saffron and Liquorish, with their Advance.
- 5 The Planting of Rape, Cole-seed, Hemp, & Flax, and the profit thereof.
- 6 The great Advance of Land by divers Orchards and Garden Fruits.

The Experimenting whereof makes good the Improvement promised.

Prov. 21. 5. *The thoughts of the diligent bring abundance. A diligent man shall stand before Kings.*

Eccle. 9. 10. *All therefore that thy hand shall find to do, do it with all thy power ; for there is neither wisdom nor knowledge in the grave whither thou goest.*

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96;324

The Epistle Dedicatory

To the Right Honorable the Lord General Cromwell, and the Right Honorable the Lord President, and the rest of that most Honorable Society of the Councill of STATE.

Right Honourable,



As a Man, or Christian, out of pure love to Mankind, I chuse rather to cast my self at Your Lordships Feet, and come under Your greatest Censure for this high Presumption, than to omit so necessary a Duty and Discovery as the substance of this discourse Imports; Therefore dare not conceale the least inconvenience that may befall the Publique, but take bolnes to present my thoughts that Your non apprehending the Prejudices hindring Improvement, nor clearely your own Capassities to remove them, and may be want of opportunity to consult about these lesser things (though very great in themselves (the practise whereof throughly promoted, might make the greater more easie) compared with our weighty and present affairs, may in some measure be an accidentall cause that Improvements of our Lands go on no better, although materially the cause is in our own sloth, Prejudice and ill Husbandry. And though I dare not present this rude Treatise unto Your Honors, to crave so high Patronage, yet I shall adventure these many most humble Representations of some Prejudices to Improvements that remain founded by a Law; And of some other Obstacles, as firmly rooted by Corruption, that without your Honors Power, and Wisedoms help therein, the Improvement

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ments here tendred will be in great measure hindred.

To the removall whereof, if Your Honors shall see cause to give iacouragement, either by an Addition of such Lawes as shall appear unto you wanting, or Repealing such as hinder, I shall not question but mens spirits will be raited to such Experimenting of the principles of Ingenuity, as that wee may see this Common-wealth soon raised to her utmost fruitfullness and greatest glory.

The particulars here are too many here to discourse at large; I shall therefore take boldness to present some few with some brief reasons to evince the same; and they are very great discouragements to the Ingenuous and Active Prosecution of the Improvements of the Nation.

The first Prejudice is, That if a Tenant be at never so great paines or cost for the improvement of his Land, he doth thereby but occasion a greater Rack upon himself, or else invests his Land-Lord into his cost and labour gratis, or at best lies at his Land-Lords mercy for requitall; which occasions a neglect of all good Husbandry, to his own, the Land, the Land-Lord, and the Common-wealths suffering. Now this I humbly conceive may be removed, if there were a Law Inacted, by which every Land-Lord should be obliged, either to give him reasonable allowance for his clear Improvement, or else suffer him or his to enjoy it so much longer as till he hath had a proportionable requitall: As in *Flanders* and else where, in hiring Leases upon Improvement, if the Farmer Improve it to such a Rate above the present value, the Land-Lord gives either so many years purchase for it, or allowes him a part of it, or confirmes more time; of which the Tenant being secured, he would Act Ingenuity with violence as upon his own, and draw forth the Earth to yeeld her utmost fruitfullness, which once being wrought unto perfection, will easily be maintained and kept up at the height of
fruitfulness

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fruitfullness, which will be the Common-wealths great advantage: Some Tenants have Advanced Land from Twenty pounds to Forty pounds *per an.* and depending upon the Land-Lords favour have been wip'd of all; and many Farmers by this uncertainty have been impoverished and left under great disgrace, which might as well have been advanced.

The second Prejudice is against that great Improvement by floating Lands, which exposeth the Improver to sute of Law for Turning a Watercourse, by Millers or others, which are minded to molest the Improvement, although the Improvement be ten fold greaer than the Prejudice can be, and the Advantage be far more publique than the others pretended loss can be, yet few dare adventure upon the work, for fear of being sued or molested.

Many great Improvements have been, and are to this day hindred and ly dead because the Miller cannot be compounded with at any rate; some I know, whose Improvements might be Ten-fold and more, the Millers Prejudice little, if any at all, because your exact husbands so clear all their boggy, low parts, and some time by their large draines break through many springs and issuing waters, that they carry a better stream unto the Miller than he had before, and his Improvement shall be able to supply a great part of the Country with Hay and Grass, where was before but little, and may be the Millars mill may be worth five or six pound *per an.* few worth ten, that usually stand upon these waters, and let him be damnified what ever he can, it is in no proportion to the Common wealths loss to such an Improvement.

The third Prejudice is, where all mens Land lie intermixed in Common Fields or Meddowes; The Ingenuous are disabled to the Improving theirs, because others will not, neither sometimes can the Improvement be made up-

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on any, unless upon all joyntly, or else upon an unsupportable Charge or Burthen. As also the not cutting straight such watercourses, of such brookes and gutters that are exceeding crooked, which some that would cannot, because of others interests that will not, abundance of the best land in this Nation is hereby lost, and wonderfull Improvements hindered, the waters raised, the lands flouded, sheep rotted, and cattell spoyled, all by this neglect.

The remedies to all the three aforesaid Prejudices, to resolve the greatest advantage to the Common-wealth, and then command them either unto a loving Conjunction in the Exchange and Improvement, or else disabling any one to hinder another that is desirous of it, giving such recompence for any dammage he shall make, as shall be adjudged reasonable by indifferent men, or competent Judges.

A Fourth is Unlimited Commons, or Commoning without stint, upon any Heath, Moor, Forrest, or other Common; This is a great Prejudice to many poor men, both Cottiers and Land-Holders; who have not of their own to stock their Commons, and so lose all, that have least need, and for whom those Commons were chiefly intended: And also a great hindrance to all; for being without that, every man laies on at random, and as many as they can get, and so Overstock the same, that ordinarily they pine and starve their Goods therein; and once in four or five years you shall observe such a Rot of Sheep, that all that the Oppressor hath gained by eating out his poor Neighbours all the other years, is swept away in one, and so, little advantage redoundeth to any: So that many thousand Acres of Land are as it were useless, which were all men limited according to their Proportion of Land or Dwellings to which the Common is due, the poor that could not stock theirs, might set them, and reap some benefit

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nefit by them : And were they easily stinted, their Commons might be as good as their own. Several to every man that hath an interest.

A Fifth Prejudice is, A Law wanting to compell all men to kill their Wonts or Moales; the good Husband doth, and the slothfull man neglects it, and thereby raiset h such a Magazine or Nursery, that they cannot be destroyed, but as fast as one destroyes them, the other nurseth a fresh supply to fill the Country: the Prejudice is greater than can be reported.

The sixt Prejudice is the not compelling men to plant Wood where they do cut down, then to set again a treble proportion or more to what they do destroy, especially now so much of the gallant Wood of the Nation is exposed to sale: We forget that it is a mighty pillar in the upholding this poor Island, and how honorable a custom it is in other Nations, that look what Timber they cut down, they must plant five or ten times as much in stead thereof: And that all men might be compelled to plow their coarser, old mossy, rushy, bankie pasture Lands, being now fittest for it and will be bettered by it, and suffers for want of it, and the Country needs it, and none prejudiced: and for the best land every man left to his own liberty.

A Seventh Prejudice is the want of a through searching of the Bowels of the Earth, a business more fit to be undertaken by the Honourable Representation of the whole Common-wealth, than by any partiular man; Whence are all our Mines of Lead, Tinne, Iron, Coales, and Silver Mines in *Wales*, were they not once hid, and as uncertain as we are now certain of them? and what should hinder but that in many places else the like may be discovered? as suppose Coal in *Northampton*, *Buckingham*, and *Oxf. Sh.* what a great benefit to those Countries would it be? Nay, if some sorts of Stone could bee but found out in some o-

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ther parts, what might it arise unto? Nay, say that either Marl, Chalk, or Lime, or some other fat Earth could be found in some other parts where they are wanting, how much would it enrich those parts? And who can say but Silver may as well be found in other places as in *Wales* or other parts? I am sure that no man knowes but he that hath searched it, and the hundred thousand part of this Nation hath never yet been tried.

The Eighth Prejudice may be the many Watermills, which destroy abundance of gallant Land, by pounding up the water to that height, even to the very top of the ground, and above the naturall height, that it lyeth swelling, and soaking, and spewing, that it runneth very much land to a Bogg, or to mire, or else to Flagg and Rush, or Mareblab, which otherwise was as gallant land naturally as could be, I am confident many a thousand a year are thus destroyed, some mills worth above 10 or 12. pound *per an.* destroy lands worth 20. 30. or 40. *per. an.* I know it of my own knowledge, I had some few yeares since a Mill Dam in my land which destroyed one half of a gallant meadow, meanes was used that it was removed, and that very land is returned to his perfect pureness again.

I prescribe not the utter destruction of all, of some I do, and others to have their water brought to a lower gage, and where they are wanting, Wind-mills erected, as in all the Fen Country are no other, or else encouragement given to some that I am confident are able to discover a compleat way for grinding all sorts of Corn by the strength of horse and man as feasible as malt is. I am able to give some assistance my self to this work, but shall far prefer others thereto, A Gentleman that hath waded so deeply therein as hath discovered publicquely his modell at *Lambeth* deserveth great encouragement.

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abominable Lusts, as Sloth and Idleness, with their Daughters, Drunkenness, Gaming, Licentious Liberty. Were not the greatest and best, and all men made to be usefull to the body? why continue many men as members cut off from it, as if they were made to consume it, are neither usefull in their bodies, minds, or purses to the common good? how comes City and Country to be filled with Drones and Rogues, our highwaies with hackers, and all places with sloth and wickedness? I say no more but pray some quickning Act to the execution of our Lawes against these worse than heathenish Abominations.

All which, with many more great annoyances and Annusances (though some may think every man will be ready to remove, but we being under such a drowsie Age, that though each particular shall be advantaged as well as the whole body, yet it will not be indeavored as far as I am able to see into mens minds or practices) are no way possibly removeable, but by Your Honour either compelling them by acting Ingenuity themselves, or else so encouraging others that are desirous thereof, that None may Prejudice Improvements, by denying any liberty for carrying on the Work, receiving reasonable satisfaction for the Damage. To which if your Honours please to add but one thing more, to give your best encouragements to all ingenious honest hearts, some such there are that have more within them than they can expresse, and many such you need; and the Common-wealth more, whom while you are carefull to countenance, from Hucksters and Impostors, God will either keep you or inable you to discover, but if any one can make A clear discovery of any new Invention for the advance of Lands, Trade or Merchandize, If your Honours please to confirm it to him for a season, to reinburse himself a little, it being unconceivable what some Ingenuous men run themselves out herein, I cannot see the least Pre-

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judice to any, but a great encouragement to all, nor can I have the least glance homeward, though plain dealing be a jewel, I finding my poor plain principles will never reach the honour of an intire discovery, if I can either draw any thing to life out of the deep judgements or opinion of the more learned, and have out any thing to a profitable experiment from my own practice, and hereby gain opportunity to cast it as a Freewill Offering into the Common Wealths Treasury, as the best and all I have to give, is my utmost Emulation. All which humble Proposals, though Unbecoming me to present, yet a hope will not be thought Unworthy the grave and serious Consideration of Your Honours Wisedome, as being so much conducing to Publique Welfare, in which you are all engaged; to whom in this your Publique Welfare, in which you are all engaged; to whom in this your publique relation, I have said so much as I must humbly beg your Honours pardon, and shall say no more because in the succeeding Epistles your particular advantages will be cleared, and in the discourse at large your selves discovered to be as much discovered to be as much concerned and as capeable (in the common-wealths advantage) of as great if not greater Improvement upon all your own particular Estates as any, which I leave before you untill the fittest season for your Lordships Consideration and actings, as may seem to you most conducing to the good of all Concernments. The All-wise God guid you in your great Affaires, and make you gloriously Instrumentall to the prosperity of the Nations; These are and shall be the uncessant and Earnest desires of

Your Honours unworthiest-Servant

WALTER BLITH.



The Epistle to the Industrious R E A D E R.

I Shall here through thy good acceptance of my former mean Peece, and earnest Importunity for the Shaddowes or Pictures of those severall Toolles I offered, and some other particular additionall waies of Improvement I promised to discover, present them all unto thee if God shall please to assist it to the Compleatment; wherein I shall a litle by way of Reparation in some parts underbuild, and some lean to, or less necessary, quite pull down of the old work, and yet not deface it neither, although by my hands it will never be uniformable, onely may be wholsome and keep warm in Winter: I shall therefore forbear to mention here any of the particulars therein handled, but refer thee to the Book it self; yet shall let them know (besides some illustrations upon some of the former passages) I shall clear my promise in all particulars as to the Land Improvement, & give in as clear a discovery of the Toolles as I can in their severall figures. And by way of Addition, or as second part, I shall hold forth how thou maiest make great, and may be greater Improvements than have as yet been usually made in England upon thy Lands divers other waies.

As First, in the Mystery of Planting all sorts of fruits, with the speediest raising them to perfection.

Secondly I shall endeavour the facilitating the great weight and burthen of the Plough, and give you the description of some formes most suitable unto ease and speed, and hope thereby to take off a considerable strength and charge from the Husbandmans daily toil.

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Thirdly, give in the best experienced way of planting *Hemp* and *Flax*, *Rape* and *Cole-seed*, *Oad*, *Hops*, *Saffron*, *Licorish*, and some other of our English wealtb.

Fourthly, I shall endeavour to discover by what means we may possible raise the benefit of the *Clover grasse*, *St. Foine* *La-lucerne* to the nearest president to France and Flanders, for worth and quality, as our English climate and best husbandly experience will admit.

And Lastly, shall take boldness, with my good friend M. Samuel Hartlips leave, to paraphrase a little upon most of those deficiencies in husbandry which his friend charges us withall, of which we have more than a good many, and not so few as he speaks of, and reduce so many of them that I have not spoke to already in my first Edition, unto Practicall husbandry that fall under any of my experiences (which though they bee but coarse and mean, yet have been gained hardly, by many toilsome tedious Journeyes, and very great and large expences) and for the further light and help to the clear understanding of the Mystery of Improvement (for so I call it, and so it will be found when thou comest to the reall practise of it, and may be more mysterious then thy principles, customes, and experience will reach unto) I would direct thee a little to consider, what hath been written in this kind by former gallant Instruments worthy of perpetuall honour. Mr. Markham did excellently for his time, so did Mr. Gouge in his Husbandry; Mr. Tusser rimes out his experiences to good purpose, and in all their bookes thou maist find out many things worth thy observation. Sir Francis Bacons *Naturall History* is worthy high esteem, it is full of rarities and true Philosophy. Sir Hugh Plats *Adams ar revived* is of good report, I never yet could gain the sight of it, though Mr. Gabrell Plats discovery of hidden Treasure is very ingenuious, and couldst thou but fathom his corn-setting Engine, and clear it to thine own and others apprehensions, it would be of excellent use without question: but for the Country Farmer. Translated out of French, with some two or three other little books, I can find but little Edification or Addition to our own English experiences, what other men can find out of them I know not, but leave to thee to discover, but for the rest they have been a great and clear light to our Horizon: yet among some of them, one is worthy reprehension, which is their large observations of season, signes and planets, forgetting God the maker of them and bleesser of all things, as if Seeds, Herbs and Plants were to be sown in the Moon or Planets, which should they be observed they

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they had need produce a double profit, because not half of any would be sow'd or planted: These times have let in so much light as will discover the vanity hereof. But I must not forget Mr Samuells Hartlips peeces lately put forth as discoveries made to him of great advancements o'ther Countries have made unto themselves thereby, both which in some particulars are naturall, and suitable, and experiment all in this Nation, and of great advantage, and merit high esteem from all, and in other particulars I know not but why most of them also may be so applied and experimented too, as to raise a good, commendable, and profitable advantage if they fall into the hands of ingenious husbandry. I have therefore endeavour'd to make my thoughts as legible as I can concerning them, as well as all other the aforesaid, though not to so good purpose as I should, yet to provoke the more Ingenious to correct them to their own advantage, although I shall render my self subject to various opinions, and though dogs bark I pass not, if the Ingenious Reader will not condemn before hearing; my design shall not be to contend against former mistakes, Now discoveries will admit some of them; but I shall perswade all men to a thorough triall of what they find most probably advantageous unto them: And what by my self shall be here held forth are most of them experimented to thy hand at my proper cost and charge without the assistance of any other purse or person, & so visible that thy own eyes shall be thy Judges; and the rest shall be so clearly held forth by irrefragable demonstration and evident conviction of the places where, and the persons by whom, as thou needest not scruple; it is time, the world is full of conceits and phantasies, nor can my self challenge immunity there from; yea reason it self hath neer beguiled me till Experience hath concluded the question: And there is a naughty generation of men that have brought an ill report upon Ingenuity through their pretences of great abilities in Engineeship, and great experience of raising and drawing water, floating lands, oyling corn, advising strange compositions for Seed and Land, pretending great advantages by Chymistry, yet have or could not bring forth the fruit of their great undertakings, some through want of meanes to accomplish their work, not wisely forecasting at first what it would cost; others indigent in their principles, having seen or done something, therefore thought they could doe all things; and others through a base spirit of deceit, and may be some for want of Patience to try the issue: all which have brought a scandall upon Ingenuity. Though I verily beleieve much may be done by many of the aforesaid

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said meanes, and more will be discovered by unthought of waies, many men having so good inventions and very able to advise great things for the Common-wealths advantage, yet may not be able of themselves to bring forth the same to publique experience; such may and do deserve some publique incouragement. A bale privacy of Spirit hath so tainted us that few can vouchsafe publique service any publique honour, nor publique Instruments a publique recompence: Yet still look thou out to duty, charge not Ingenuity as an innovation, but act vigorously in thy station; good husbandry is as the sinews and marrow that holds together the joints of common good; all workmanship without Invention resolves it self into the workmans belly; for though a new world hath been of late discovered, yet there is not an occupation or trade of finding them, nor are our English people very active in searching after them; Study Improvements, which though they may not be said to be either Father or Mother to Plenty, yet it is the Midwife that facilitates the birth. See what shiftings people make for livelihood, how many severall callings doe men make, and yet unmake the main: The exercising these projections accompanied with a blessing (if I may so call them without offence) will open a way to the relief of thousands. The Common-wealth is low, and misery and penury will follow if we do not rouse the sluggard, and post after Industry, pursue all advantages of Improvement whatsoever: It is a great argument to quicken me to the more speedy publication of this third Edition, & the rest of the new additions to it; & though I here hold forth most of my own experiences, & may be said to be a Trumpeter of my own praise, yet if thou wilt but consider, First, that many of these particulars have been wrought as particular Rules or instructions to private friends as my own experiences, & to alter them will make so great an alteration in the whole, as my present occasions wil not suffer. And Secondly, because I find so great abuse by some mens high affirmations, proving but conjectures, as hath brought Ingenuity under the scandal of projects & new devises, which men will scorn to deem them so when they are made experiments. And thirdly, because the subject, though poor & plain to be discoursed, and great proof made thereof to good perfection, yet when thou comest to the thorough practise thereof, thou shalt find it so ambiguous, as notwithstanding, all my allusions to my own experience will be little enough, and then thou wilt excuse me. And could the Author have been thus supplied, it is great odds whether this Peece had rendered it self unto the hazard of acceptance or disgrace in so rude

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a manner; I should have added much more, but that the Epistle might have swelled into a volume, and therefore chose rather to divide what I had to have spoke to the particular ranks of men whom it most concerns, and so have distributed to each a portion as I conceived most suitable to work their spirits into a flexibleness of practise and acceptance, which if they set unto experimenting, I hope they will raise such fruit thereby, as to witness to, or be Credentiaalls of my Frontispeece.

Although I endeavour so mainly to work my Improvements out of the Belly of the Earth, yet am I neither of the Diggers mind, nor shall I imitate their practice, for though the poor are or ought to have advantage upon the Commons, yet I question whether they as a society gathered together from all parts of the Nation could claim a right to any particular Common: And for their practise, if there be not thousands of places more capable of Improvement than theirs, and that by many easier waies, and to far greater advantages, I will lay down the Bucklers: Nor shal I countenance the Level principles of Parity or Equality, which they seem to urge from the begining, till I see the heads of Families and Tribes, Judges and Governors, Lords and Princes of whole Countries, blotted out of the first or succeeding generation; unless they bring us to the new Jerusalem, or bring it down to us, when we shall not need to trouble our selves about greater or lesser, or any distinction of person, places, or estates, any more, but this Parity is all I endeavour, to make the poor rich, and the rich richer, and all to live of the labour of their own hands. And thus clearly demonstrating what I have promised, I hold my self disoblighd in all my promises, except in this which will be fitter to be presented in a Volume of it self, after some good proof given to the world of thy industry in improving thy lands, viz. Some speciall directions when thy Lands are improved, how to use them or stock them to the best advantage of the Common-wealth and thy profit, and therein shall endeavour these five or six particulars, First to hold forth the best way or meanes of breeding or rearing all sorts of cattle, sheep, beasts, or Horse. Secondly, to shew the way of Cow-keeping, Dayring, or raising most Cheese and Butter. And thirdly the waies of Grazing and feeding all sorts of cattell; All which are three staple Advantages of the Nation, and will hold hands with Tillage, Corning, Trade, and Merchandize; and shall add, Fourthly how to raise a great advantage out of Goates and Conneys, for your harder stocking Lands, and some two or three more particulars, that thou
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maiest not be wanting in the usage of thy land as well as in the Improvement of it, and it shall strive exceedingly to dismyster them all, and in the fift and last place shall proportion all with the most suitableness I can to those severall lands by which they may advance the highest profit and greatest increase, and all as largely and plainly discovered, as I am able. By a wellwisher

Of prosperity to each self, which is
the Common Wealth,

Whose faithfull servant is

WALTER BLITH.

To

To the Honorable the Souldiery of these Nations of England, Scotland, & Ireland.

Gent. Commanders or Souldiers.



I may be thought strange to direct an Epistle of this nature to you, as conceived by most, least capable of being Instrumentall of advancing the common good in this nature; yet knowing strange things are wrought by contraries, and finding the best husbands (through my observance) among those who have been least conversant therein, have not the least hopes of you; yet from a Principle of charity too, lest that your learning your fingers to fight, and discontinuance of your callings, might disuse your bodies and minds so from labour, as to discourage you from your callings, have thought fit to let you know, You also may be very capable to doe good service to your present Generation in this design: And though many say you are more likely to lengthen out the War to prevent *Improvements*, I am of better hope, and sure, that the Armies late progresses have manifested the contrary, yet I shall humbly take the boldness to press your speeding as full an end thereto as you are able, both for your own good, and these Reasons.

1 Because of the goodness and welcomness of a Calm after a Storm, no less will be a settled Peace after so great a War, and a little breathing will recover strength and spirits.

2 Because you need not fear want of good Employment afterward: This piece will open many doores for that, and I am confident Activity and Ingenuity will much enlarge our Quarters, and make this Nation *Rehaboth*, and with good husbandry indeed would more comfortably maintain hundreds of thousands more than are already born, and I hope you will learn to hate *Idleness* wholly, as love *Liberty* dearly.

3 And lastly, because your selves are interested and possessed of many lands, and those such too as will admit of great *Improvement* with wise management, and some of them as great as by this discourse is here proposed; and though you may conceive your late lands designed for your pay were highly surveyed, and to all advantages to raise them, yet those advantages of Improvement were not to be considered, nor indeed could be discovered by them which understood them not; nor was any of them purchased at any other rate than the present value to be then set and let to present Tenants; which Lands are as full of vast Improvements as any lands in *England*: for all which causes I need press no more, but in the honour I bear to a Souldiers name, which God himself hath honoured by styling himself a Man of War, although I take no pleasure in War, otherwise

therwise than in submission to Gods will, and the accomplishment thereof, which is not to be resisted or repined at for the satisfaction of our inclination to ease, peace, or rest; upon this account or any other, I beseech you (so long as necessities command you to it) to preserve alway a good Conscience within; for although hopes of Victory without may carry man through great hardships, yet your peace with God reaches up to heaven, and cannot be sealed with Ladders, nor undermined with batteries, being founded upon a Rock, nor starved with famine, a good Conscience being a continuall Feast. Mr. Fuller in his holy War gives this description of a good souldier, That he that is most couragious in War, is quiet and painfull in Peace, and comfortably betakes himself to his calling: The wielding of the sword hath not made his Spirit unwieldy for his private Calling. And I having this opportunity to distribute this mean peece unto the World, thought good to offer a Portion amongst you the Honourable Souldiery, as for Edification how you may turn Improvers too, also humbly to desire your assistance in the work so far as in you lieth, to remove some grievances and Impediments of the Common-wealths advantage, largely discovered in the other Epistles, which brevity causes me to omit, and so no more but humbly pray you study how to serve your present generation in extolling Gods glory, endeavouring the common-good, and in the interim abandon privacy of spirit. Remember Christs Counsell, view the promised Land, and rejoyce to think of that day when your swords shall be turned into Ploughshares, your speares into pruning hooks, and Christ only be exalted in the Earth, and you brought back again to sit under your own vines and figtrees, eating the of fruit your own labours, and enjoy one another in Peace, which once accomplished, here is cut out work for you, some to till the Land, and others to feed the Cattell, as from the beginning, so will this be the lasting Improvement. Then will the God of Peace keep them in perfect Peace, whose minds are stayed on him, And Emanuell will break in pieces all that gather against him, which is the Confidence and full Expectance of

Your quondam brother, fellow Souldier,
and very Servant

Walter Blith.

In fine, all Land in each Capacity,
In which it lies, made Pleasant to your eye.

P. W.

012 04 76 3 3221222 277

A true Friend to thee, as thou to all.

P.W.

Place this after the Epistles.

To Captain W. Blith upon his Im-
proved Improver.

FEr, upon search amongst the multitude
Of human race appear, who are endu'd
With such a noble Genius, as by art
Can heighten Nature, Fewer this impart:
For 'tis an Axiom unto most unknown,
That that's the best of good which most is shown;
Unless some Patents for the same require
With publike recompence their private mire,
How then ought all to Count this Author rare!
Who by experience and observant care,
Knows how to husband grounds to their best use,
And doth to publike light what's known produce!
Who clearly aims in what he doth unfold
At Common good still adding new to old.
He gave us heretofore to understand
The Art of floating and of watering Land,
Taught us how Fens and Bogs we ought to drain,
How each one might by fair Enclosure gain,
How ancient Pasture might by tillage mend,
Till'd ground by Grazing to improvement send,
What soyl and compost for each ground is good,
And what waies further best the growth of woods
To these this third Edition doth discover
The most approved means to husband Claver,
The art of planting Liquorish describes,
Of Madderdwood, and wald for richer dyes:

The

The Planting Cole-seed; Flax and Hemp's declar'd
And how the Ploughs expences may be spar'd.
How of especiall use ground may be made
For Gardens and for Orchards, is displaid
Which this Survey of husbandry discovers
At easie Rates but not without endeavours;
Improveth Land, to three or five Degrees,
Held forth most plain, not kept within skies;
But casts it all in such a curious mould
To raise from one to ten, yea Twentyfold:
Lastly the Souldier doth example yield,
How he should till as well as fight the field,
How swords should turn to plough-shares, when warres cease,
And what employment suits with times of peace.

Thine upon the pub-
lique score

T. C.

The first thing I should mention is that
 the weather was very good today.
 We went for a walk in the park
 and saw many beautiful flowers.
 The children were very happy
 and played for hours.
 We also had a picnic under
 a big tree. The food was
 delicious and everyone enjoyed
 it. We spent a very pleasant
 day and will go back soon.

Thine upon the dubs
 linc leoric

Y. C.

To the Husbandman, Farmer, or Tenant.



O you of all others I might spare this paines, you the very practitioners, you that trade in Husbandry, of some of you I have high things to report, both for your industry and activity; and though I am confident all men are thirfly enough after profit and increase, yet few studiously industrious in this design; though some esteem it matter of greatest moment, yet you will not all be found patronizers hereof; there is such a Randall and prejudice among many of you against new projections; that I shall beseech you to take a loving admonition in two or three particulars, The first is an Epidemicall disease (and little less are the succeeding) and it is a great mischief to your selves and the Common-wealth, and that is such an immoderate plowing your land, some plow far more than they can Till or Manure, and others all they have in common, though never so much, others plowing so oft and low, that they draw out the marrow of it, and these are the great Improverishers of your gallant old pasture, though fit enough to plow, & might be best advanced thereby with moderation; but into both these extremes men are so apt to run so fast, that I desire to stop their course a little, and shall make bold to tell them, that when half or one third part of so much land as many of you Till, shall with that very soyl, and half the labour and seed sowed, yeeld you as much corn as all that great quantity scramblingly husbanded, that then you are ill husbands; which you will confess if that you will but grant me that which no man will deny, that one Acre purely husbanded (and what need any be otherwise, or any break up more than he is able well to compass) will be as good as two or three in many mens ordinary practise, but in some of your whole-sale husbandmen that plow all before them, four or five Acres will not baltance one purely husbanded, then judge so much land preserved from impoverishment, so much seed and cost preserved, and yet as great increase, whether the opposite efforts be not enemies to themselves, families and Common-wealth. The second abuse is want of good tillage, wee lose our hopes exceedingly by this; and herein we must both have respect to season, land, and corn; for good seasons at all times cannot be expected, yet of two evils chuse the least. I am confident better sometimes lose the land, than land, seed, and all your labour, as many do that outstrip the season: but for prevention, begin earlier, I am confident though it may admit of some inconveniencies sometimes, yet at other times it is out of question, but generally both Summer and Winter seed-time carries it away, sure it hath these advantages, that if it prosper not, you may sow is a gain, or if the latter part of seed time at Michaelmas time prove wet, you are well, having sowed before, or the latter part of seed-time in the Spring prove dry, as most oft it doth, you have prevented that, and what is the great danger of growing prowd in Winter, that is to mee a vertue, and if in the Spring, it is easily taken down also; and if thou fearest weeds, I am of opinion that the stronger and thicker any corn is, it preserves it self the best from weeds; but there is a Medium in all things, too thick sowing may be as bad, but this ever observe, that the earlier thou sowest, the thinner thou maiest sow thy winter corn, and summer too, if the season be good, and land dry and sound: And secondly, to your land you must have respect too, Land in good tilth, in good heart and sound, in a good season, will out-cast its very marrow, through the Lords blessing exceed fruit enough: Men much wrong their corn in not giving their Lands sufficient workmanship, I am not pre-

eise in the number of Plowing nor Harrowing, but just so much and no more than preserves the Land from weeds, and best brings the land into such a composition that your Land mould well. I shall not justify the old Proverb, here, No balke no corn, I say no balke, all corn, even cleanly plowing is commendable and most profitable; to some grain more tillage, to some less is required, yet to none no less than may both cover well and yield good bar, some and rooting to the corn. And thirdly for your Corn, some graines require more tillage, others less; some will better bear a drier season, some a wetter; some grain more subject to one weed than to another, some grain will do best with two summers, and others with one. In all which consider and advise thy self as much as thou canst of the nature of them all, and make out what experiences thou canst thy self, and somewhat incline to the most ingenious usage and custome of thy Country. In some cases a good custome is instructive; but I'll be brief here, that I may be a little larger elsewhere following. The fourth and last abuse is a calumniating and depraving every new Invention; of this most culpable are your mouldy old leavened husbandmen, who themselves and their forefathers have been accustomed to such a course of husbandry as they will practise, and no other, their resolution is so fixed, no issues or events whatsoever shall change them, if their neighbour hath as much corn of one Acre as they of two upon the same land, or if another plow the same land for strength and nature, with two horses and one man, as well as he, and have as good corn, as he hath been used with four horse and two men, yet so he will continue. Or if an Improvement be discovered to him and all his neighbours, he'll oppose it and degrade it; What fourth saith he, who taught you more wit than your forefathers, would they have neglected so great advantage if there had been any? they kept good hospitality, and made shift to breed up many children, &c. and I know not what simple chaff is blind themselves, this proud unteachable spirit an ingenious man abhors, which bane and poisons the very plenty of our Nation. These prejudices both upon your minds and practises which baulk you out from wealth and glory, my dear friends and fellow husbandmen, I pray you lay aside, and doe but in charity walk with me a little through this discourse, and I shall hope to satisfy that there is no other end but common good proposed. The poor, thy posterity, and all Interest advantage here intended by him that is as studious of thine, the Common wealths Improvement, as his own.

W. B.



*The severall waies of Improvement, or
Advancement, of the Lands of this
Nation : many whereof are undiscover-
ed, and most of them little practi-
sed, which being experienced, would
be the Common-wealths glory, and a
pattern to other Nations.*



Or the discovery whereof (by Gods
leave) some particulars shall bee laid
down as generalls to be discovered.
And that I may speak to the under-
standing of all men, especially those
who have little or nothing at all con-
sidered of such things, nor so much as
ever suffered the practise part of Hus-
bandry to come into their minds; or those who in respect
of their more noble and high employments, have lived, and
conversed in another Region, about the weighty affaires of
the Nation; onely receiving & living upon the present profits
of their Lands, not minding their Lands advance; And some
few others who have lived more above the creature, and con-
versed much in heaven, and so are more unacquainted with

the language & termes of Husbandry: therefore I will deliver my self in our own naturall Country Language, and in our ordinary & usuall home-spun termes, especially because I can speak no other, & in as few words as I can possibly conceive it clear to each apprehension; and therefore before I begin to enter the discourse at large, give me leave to premise the Excellency, Necessity, and Usefulness of improvement, or good husbandry; And then the discourse shall follow under these two generall heads:

1. First, I will discover the causes of Barrenness upon all Land, and what corruptions both in the Land it self, and in mens opinions, practices, and customes, must be removed.

2. The second generall, being the Remedies and Preventions, of the said Barrenness, and the meanes of reducing some to its utmost former Fruitfulness, and Improving others to the greatest advantage it is capable of; wherein that great Improvement promised is held forth at large. All which will be discoursed under

*Six Severall Heads or Peeces of Improvement,
which are made good,*

1 **B**Y floting or watering all sorts of Lands which lie under that capacity.

2. By drayning or reducing of Boggy, Fenny, Sea or drowned Lands to firmness and fruitfulness.

3 Shall be by such a way of Enclosure of common Fields, Heaths, Moors, or Forrests, as shall admit of no depopulation nor prejudice to any particular Interest whatsoever.

4. Shall be by such way of Plowing or coming some old Pasture Land, already spoyled for want thereof, as shall much better it, and by so pasturing others, already destroyed by plowing, as to recover it: and divers other waies to improve your lands to a great advantage.

5 Shall be a discovery of such simples or Materialls, as Soy- compounded with the Earth, with the nature and use of

of both, so as thereby you shall raise so much more Corn unto this Nation as shall make good the Improvement promised.

6 By a new Election or Plantation of divers sorts of Woods and Timber, as in few yeares a man may make sufficient buildings thereof; yea upon divers sorts of Land in this Nation, at twenty yeares growth it will arise unto an incredible height and bigness, yea as fast again as it naturally groweth.

CHAP. I.

Treateth of the Excellency, Necessity, and Usefulness of Improvement, and good Husbandry.



High appeareth partly by the Antiquity of it; Excellency, for every thing is the more excellent, the more Necessary, ancient, and nearer it comes to God, the first Antiquity. being of all things, which as all things nearest the Center move more strongly, so all Excellency appeares most evidently, the nearer (if I may speak with reverence) to that great Majesty, the great Husbandman, God himself. First in his making the world, hee made all Creatures, and all Plants, Fruits, Trees, Herbs, and all bearing Seed, for the food of Man and Beast; He also made those more excellent and glorious Creatures, as the Light, the Day, and Night, the Firmament, the Earth, and Seas, the Sun, Moon, and Starrs, all to be serviceable, and ministers unto the Creatures relief, and all the Creatures subservient to Man, and Man to Husbandize the fruits of the Earth, and dress, and keep them for the use of the whole Creation.

So God was the Originall, and first Husbandman, the pattern of all Husbandry, and first projector of that great design, to bring that old Masse and Chaos of confusion unto so vast an Improvement, as all the world admires and subsists from. And having given man such a Patern both for

precept and president for his encouragement, he makes him Lord of all untill the fall; And after that God intending the preservation of what he made, notwithstanding the great curse upon Adam, Eve, and Serpent, the Earth not going free, but a curse of Barrennesse cast upon it also, yet Adam is sent forth to till the Earth, and improve it, *In the sweat of his face he must eat bread untill he return to the Earth again.*

Gen. 4. 2.

Gen. 9. 16.

2 Chr. 26. 11.

Prov. 6. 6.

Prov. 15. 19.

Prov. 20. 30.

Prov. 22. 21.

Prov. 12. 20.

And so down to Cain and Abel, the one Husbanding the Earth for Tillage, and the other the Sheep in Pasturing, and Grazing; and so down to Noah, he began to be an Husbandman; and to Abraham, and to Jacob and Esau, and so a long still till they came to the Government by Kings, where Uzziab his commendation was *beloved husbandry*, and many excellent things, as if Husbandry were the most excellent, as indeed it is here on Earth; else ask Solomon the wisest, the second Husbandman or Improver of the world, and you shall find, how out of the depth of his experience, he cries up diligence and activity in good Husbandry, *therefore sendeth us to the Pismire, cryeth down the Sluggard, and Sloathfull, on whom commeth poverty as an armed man, and extolls the diligent as fittest to converse with Kings*, whose very thoughts bring abundance, even of the diligent, whose hand and heart are best to bear rule, when the idle shall be under Tribute. But to multiply more Scripture, where all experience holds it so clear, is but to prove a principle ungain-said; I'll say no more. But for the usefulness of it, it's no lesse than the maintenance of our Lives, Estates, this Common-wealth, and world, and the Improvement, or Advancement of the fruits and profits of the Earth by Ingenuity, is little lesse than an addition of a new world; for what is gained hereby either above the naturall fruitfulness of the Earth, or else by reducement of that which is destroyed, or impoverished from his naturall fruitfulness, to greater fertility, is a clear augmentation or Addition to the Common-wealth.

All other callings proceeding hence, the Earth being the very womb that beares all, and the Mother that must nourish and maintain all. The Merchant is a gallant servant
to

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to the State, he fetches it from farre, and tis a gallant Inrichment to this Nation; but he purchaseth it from others, who could make good profit of it, if he buy it not, raiseth it not out of nothing, but parts with good Silver, or Gold, or some good commodity for it, and is a great Common-Wealths advantage.

But this Merchant of Husbandry, he raiseth it out of the Earth, which otherwise would yeeld little, unless this ingenuity fetch it out, possibly never discovered to be there. And what parts he with? or at what rates purchaseth he it at? Even onely with the wages of the labouring man, whom he is bound both by the Law of God, Nature, and the Land, to maintain, who may be were he not maintained in work would cost as much to be maintained idly. Oh! the Excellency, Antiquity, and Usefulness; of it. Improve the first and chiefeft of thy Spirits on God in omnifying him above all, and in all, and the rest of thy wits and strength to serve thy station herein, accompting it the second thing necessary, *a blessing being upon the head of him that tilleth Corn, and the thoughts of the diligent bring abundance.* And so I proceed to the occasions of the Earths Barrennesse, being the first Generall of my discourse,

Prov. 11. 26
Prov. 21. 5.

First Generall Head

CHAP. II.

Sheweth forth the causes of Barrennesse upon all Lands.



Hey are usually two.

- 1 In Man himself.
- 2 In the Land it self.

Causes of Barrennesse.

1 In Man himself it was occasionally, who by his sin procured a curse upon the Land, even Barrennesse
it

it self, which by the sweat of his browes must be reduced, if he will eat bread, and so now is.

1 Cause of
Barrenness is
ignorance oc-
casioning pre-
judice.

2 In man naturally, which is the main and capitall cause of all, and is in him as I conceive the Cause of Causes, which is Ignorance, occasioning the prejudice men bear against Improvement, especially that which is not of their own devising, as all men naturally hate the true light of God, because it discovers their darkness, and is contrary to their light, which is that of Nature and Reason onely, the great enemy of Gospell Light. So that parallel hereunto in some measure, is the hatred that many bear to any new Ingenious discovery of that which is not under their ken or common practise, unlesse they can make it their own contrivement, which ariseth from old *Adams* proud nature so rooted in ours, that wherein we cannot ascribe unto our selves the praise, we had rather lose the profit, and so presently decry the same, Saying, This is no other but a principle of some young Brainsick, or of one that would Monopolize more to his ten, twenty, or thirty yeares study and experience, than our fathers and fore-fathers attained in all their practices; or else some giddy head that will say more in half an hours discourse, than he will make good proof of in an Age; or else it is an experiment that will cost more than the profits thereof will countervail; or else the Improvement is so great that they cannot possibly credit such impossibilities, with innumerable more such passages; never putting forth their Mindes, Hands, or Purse, to never so great and profitable an advantage, like the Sluggard, who will not plow, but saith, *A Lion is in the way*. And so, by feeding upon these or such like Prejudices, they suffocate their own unspeakable advantage, which they might accomplish with setting on the work, and exercising a little patience in waiting for a through triall. Although he say it should be our rejoycing when any discovery is made, (chiefly of God) & then of that which shall concern the publique good, be the instrument what he will, and not ingaged therein for meere advantage only, as too many have done, holding forth specious Pretences of great wonders, and the condition

Prov. 4. 15.
Prov. 26. 13.

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condition hath ever been great gain to the discoverer, and more than the worth of the discovery many times hath been; yet if the naked end be the Publick good, be the discovery what it will, or the Discoverer conceived neither of so deep a head, nor of so long experience, as others have been, yet, though thou conceive it a Project so chargeable, that will not answer the cost bestowed, or an advance so great as is not credible, yet consider if he utter Reason, Art, or honesty, and especially where he offereth experience for the proof thereof, have thou patience to consider thereof, if thou wilt not make triall of it, his is the paines, and if to any, it is thy Gain, he hath but his labour for his travell.

The second Hindrance as in respect of the owner, or occupier thereof, is Idleness, Improvidence, and a slavish Custom of some old form, or way of Husbandry, exercised therein ever since they were born, which begets so much the ill Husbandry of these dayes, never affecting Ingenuity in any particulars of their Husbandry, which is contrary to the mind and will of God in making us, and the end wherefore we were made, Good husbandry commanded, and so experimented by God himself, and charged on us therein, and so commended by *Solomon* the wisest of men, with Ingenuity and Activity, to the putting out the utmost of our spirits, in subordination to our spirituall calling, in our particular callings to serve our generations, and improve our Principles for the common good, which two aforesaid causes if they be not removed, will never admit of the removal of the subsequent causes.

2. Cause is Improvidence and a slavish custome.

A third particular cause in man of the Earths unfruitfulness, is want of severe punishment of Idleness, the Mother, and Drunkenness, the Daughter, or the putting in execution of such good and wholesome Lawes as both God and man have provided therein; As also not raising stocks in all Countries, as a Magazine or treasury of work, and labour, for those that want it; And those other Lawes for punishing of Rogues and Vagrants, that wander the Country, and compelling and constraining youth, and idle people, to some callings, All which would both put them on to more In-

3. Cause is want of punishment of Idleness, and want of Stock to set the poor on work.

E

genuity,

A Crying sin,

geniuty, and the Gentry, and Ycomanry of the Nation would be much induced to Invention, and expatiating themselves in charge and treasure, to maintain them, whereby these horrid sinnes of Idleness, Lust, and Laciviousness would be checked, and those Drones, and Caterpillars, the bane of a Christian State, and shame of a Christian Nation, would not so swarm amongst us. It is a crying sin of our Nation, I pray God charge it not upon us, lest as we have already smarted for it, we smart not now at last to purpose. So that were but these Improvements put into Experiments, their great plea would be silenced (*viz*) *Will you set us on work? we will work if you'll provide it? &c.* (and out of all question) the capacities of the Nation herein, are far more than here be labouring men to act them: and so as they conceive, they justify their Abomination, both by necessity and authority.

Drunkennesse

As for Drunkennesse the Daughter, which so aboundeth every where, that I verily believe, and fear not to make it forth, by reason, and experience, that were it the Daughter, with Idleness the Mother, suppressed in this Nation, wee need never to fear want or penury. I know divers Towns in this land, where you shall have two or three poor Ale-houses, wickedly, and wastfully, devour more Mault, than all the Freeholders, Labourers, and Inhabitants besides. And judge you, Labouring Countrey people for the most part brew their own Beer also, neither is there any passage, or Road-way through the Townes where these private houses of resort are, and yet these to vent so much Beer or Ale, is wonderfull! How much then is consumed in great Passages, common Roads, great Towns, Markets, or Cities, wastfully and wickedly, if so much be in Corners remote, and not thought of? so that were there a suppression hertof, how would Idleness be abashed? men would scarce stand idle in open wayes, or passages, for shame, wife and children enjoy their Fathers, and Husbands at home, if doing little, yet not consuming that they have got already, and the Markets more full, and plentiful of corn so miserably wasted; And therefore as I highly commend these Lawes

we

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we have already, and praise God for them, so I humbly pray a quickning of their execution, wherein our Worthies, had they not so heavy pressuures upon their shoulders, as are ready to break their backs, (I am sure they have broke the spirits already of divers, whose loss we have cause to lament with watery eyes) they might humbly be implored for some Inlivening, Quickning Lawes, with such strict penalties annexed to the execution of them, as the Discoverer or Projector might not onely be rewarded, but commended and protected from disgrace and calumny.

The second generall cause of Barrenness is in the Earth it self, and the principall causes of her Barrenness are very many, some are obvious to the Judgement, and understanding of all, as tilling Land till it bear no corn.

And mowing Ground till it Geaze no more; or yeeld no grafs; all which are easily to be remedied if men would learn moderation.

But my design lyes not so much in Reproving, as Improving, and discovering that there are many causes which lie more obscure, and are either not discerned at all, or else not adjudged any cause of Barrenness, or hinderance of the Earth her fertility, and so not at all endeavoured to be removed; and they are in some Lands, extreme Coldness of nature, having a moist springing water lying near, or just under the surface or superficies of the Earth, which doth either eat away or devour the Sap, Fruit, and Strength of the said Lands, or else breed and increase the Rush, and Flagg, which groweth in the room of Grafs, and eateth away the same.

Another cause is Rockiness, Stoniness, and Graveliness, all which many times lie so near the surface of the Land, that they devour much of the Earth, and so make that little left so weak, that it can scarce bring forth any fruit.

Another cause is lying Mountainous, sometimes so neare the Sea, that the Vapors and Fogs, that come from thence, annoy the same. Also lying far from the Sun and in shady parts occasioneth Barrenness.

Improvindence
laying down
all Lands.

How to lay
down warm
Land.

How cold
Land.

Another cause of Barrenness is the unsuitable, unnaturall laying down of Land to Graze, a cause scarce imagined so to be; or the present ill lying of Land, that hath layen long, and was ancient Inclosure, al which are infinitely more prejudiciall to the fertility thereof than can be imagined, till contrary experience hath discovered it: (*viz*) For that Land that is sandy, warm, or gravelly, that to be laid on high Ridge or Furrow is directly contrary to the naturall fruitfulness of that Land; And that which is of a cold, moist, spewing or weeping nature, for that to be laid down flat or levell, is to the ruin and destruction of that also, and is an extreme on the other hand.

The latter sort requireth high ridged Lands, and clear open Furrowes; and the first sort the contrary: and especially all lands whatsoever to be laid down in good heart and strength.

Standing water
in winter.

Also another cause is the standing of the winter water upon the land, or the rain of Heaven; I say not the running over lands, so that it may be laid dry at pleasure, but the standing, soaking water breeds the Rust and fowlness, and likewise gnawes out the heart and strength of it, like the worm at the stomach, and devoureth the strength of it, as experience will shew in many parts of the Land, where great Balkes betwixt Lands, Hedges, Meares, or Divisions betwixt Land and Land are left, and one Furlong butting, or Had-landing, upon other Furlogns, makes such a stoppage of the free passage of the water, that a great part of that land lyeth as it were drowned a great part of the year, that it overcomes not that backing many times till near Midsummer, when other sound Lands have yeelded a full half yeares profit, and so for half a year yeelds little or no profit at all.

Mole-hills.

Another great prejudice is the Mole-hills, and the Ant-hills, although I shall not directly argue hence Barrenness naturally, yet accidentally they much barrenize it, therefore I shall demonstrate the evill of both; for the Mole-hills that destroyes some part of the Land, by the severall casting up of much mould upon the Grasse, all which are hinderances very great to the increase of the owner. But for the Ant-hills

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hills, if my opinion fail not exceedingly, they are grand enemies to the Grazier, and Husbandmans advantage, they destroy more than men observe, I do beleve that in some great Pastures in *England*, there is one fourth part of the clear fruit of that Land lost by the multiplicity of them, and little better in other pastures by the Molehills: for although some are of opinion that the Ant-hills are little or no prejudice, they are much mistaken, and they will clearly be convinced thereof, if they will but either seriously consider the quantity of grass that groweth upon them, or else consider the rareness of Cattle feeding upon them, and then also consider the quantity of Ground, and good Ground, they cover, will easily appear the great prejudice by them. And that the sand and gravell washed from the Mole-hill, is a great cause of rotting Sheep I absolutely affirm.

But thereto some may object, they make more ground.

I Answer, they do, such as it is; destroy a lesser good quantity of Land, and add possibly a double bad: but let them consider that this Addition is a great Substraction; for if you weigh what I said before, they bear little, or no grass, a little wild Time, and speary harsh grass, that Cattell eat not but a little thereof in case of hunger; And I am sure they cover a great deal of good land. Doe but really consider it upon experience made upon one Acre, and thou shalt find that one Acre plain or bancked shall do as much service as an Acre and near an half shall do that is so hilly; And again if you do not flatter your selves in your own judgments, you will find that while the Land was plain, if you consider the fruit it then yeilded, and the Cattle it then maintained, you will find there is no proportion between what it then kept, and what it now maintaines, for in my experience I find that old resty Land, much overrun with these hills, much degenerates, and doth not, nor hath of late yeares kept the former usuall Stock it kept before it grew so hilly, and so old, by near or about one fourth part, which I am sure is as much or more advantage, or clear profit, the Grazier, Breeder, or Tenant need expect; and although some will not acknowledge their experience here-

Ob.
Ans.

in, yet many I am sure they find it by losing proof, besides the danger of casting their Cattle and Sheep betwixt the Hills, which oft destroys them.

Bogginess.

Another cause of Barrenness is Bogginess or Mieriness, which turns all Lands, both bad, good, and better, into such a State of Barrenness & unfruitfulness, that it in some parts almost destroys the Land, and in other parts it wholly destroys it, and in some places makes it worse than nothing; for in stead of yeelding some fruit, it not onely yeeldeth none, but corrupts and prejudiceth other Lands on which it borders, and it self most dangerous to mischieve the Goods or Chattell that do pasture upon the same, and so may be accidentally many degrees worse than nothing.

Constant resting of the water on that Land.

Another cause of Barrenness is the Overflowing, and constant abiding or resting of the waters of the Sea, Fenns, Rivers, standing Lakes or Pools, for be it fresh or salt water, if it lye constantly upon it, it assuredly destroyeth it; although some more, some less, according to the deepness, and barrenness of the water which covers it, & the soundness of the ground on which it lyeth, so is the fruitfulness more or less perspicuous. Some pretend strange causes which my plainness fathomes not, nor much affects our Country Farmers now.

Yet one more I must not pass by, & that is such New Inventions for the Improving of Land discovered by some young Husband-man at experiences as I conceive the use wherof will rather destroy Land, and waste a mans profits therupon, than advance: & some such I have lately found in a little book called *New Inventions for the Improving Lands*, Printed for J. S. and sold at the sign of the Ball on Adling hill, 1646. By which I fearing some willing to lay out themselves in Husbandry experience should be beguiled by his so great overtures of Advantage, I shall onely speak to two or three particulars, and leave the rest to thy leisure to consider of.

First, As to his manuring Plough, manuring Wagon, manuring Stone, Corroding Harrow, or Corroding Rakes, which he pretends as Improvements, so far as my shallow Principles will compass, are likely to prove Impoverishers, because

because while a man stands to dress his Land with fine mould, in which is a little strength, his Land decays for want of good soyl or ranck muck, which he may sooner lay on, & work into his Land by the old way, than he may his fine earth by his new devised mysticall Instruments, not one of them discovered neither; but puzzle thy self thou mayst about the thoughts thereof, and though thou givest twice as much for the book as it is worth, for so thou must, thou art but where thou wast at first: And for his Seed-Barrow, could he but hold that forth to set Corn as he pretends, it might be of some good use, because certainly setting Corn, could it be done with speed, and at a certain depth, and well covered, would be worth discovering; but of this I have as little hope and as low an esteem as of his other afore said Instruments, because he holds it out to contain one Tunnell onely for his Seed, which did it contain a hundred, would more likely prove; for in setting one seed at once, no Engine can come near the hand-setting as I conceive; And this I charge as a great prejudice, and may be as a barrenning the land, while men stand looking for great things, they neglect their ordinary and old way of Husbandry, far better.

Another cause of Barrenness which this Gentleman puts as a meanes of Improvement is the setting up or banking into a mans land the Rain water, or cold Spring water, and then trampling in dung by carting and cattell, as he saith, will raise and increase mire and dirt; and so it will, I must confess, but what that mire and dirt is worth, I know not: the dung would be excellent good of it self, but what it will be in this course of husbandry, I not only much question, but affirm, that in all my experience, that treading, poching, and holing land in winter, was an exceeding great hinderance to Corn or Grasse that Spring; nay some Land I have known so poched by Cattells treading, though sothered upon the same, both in *Kent* and *Essex*, and many other parts, that it hath not recovered of divers yeares: And what strength or vertue cold spring-water or rain-water hath to fatten any land, I know not, but wonder then how we have any barren land in *England*: And to make good his Assertion, he appeales

peales to them that float Land by Rivers, whose practice clean confutes his opinion, who stuy to drain their Land as fast as float it; and the best and most skillfull of them will drown none at all, unless for a day or two, but drain as fast, and draw off as fast as they bring it on: And to prove his Tenent, he affirms how advantageous it will be in keeping up the floods by his inbankments to secure the Fens from drowning, which is as likely as to keep the Sea from flowing after ebbing; for he that will make banks to keep in Land-floods, may as well make a hedge to keep in the Cuckow; and whereas he pretends hereby to raise new Springs, that may be; sure I am he will raise new Quick-lands, and what good use they are of, I am yet to learn. And for Barren Land which he seems so well skilled in the Improvement, which he desires to purchase, I will help him to enough, if he will either be pleased to return a mild answer if my plainness have offended him, or else practically make good what he hath affirmed; for that a man doth do, is far more credible than that he affirms he can do. Many other causes of offences might be spoken unto, but they are referred to a more proper Opportunity, wherein they may receive a more suitable capacity of removal, and will be dropped into the discourse at large, as occasion most seasonably is administred. And so I proceed to the Recoveries of the said Barrenness. But before I descend to the particulars, consider the severall sorts of Lands that will admit of Improvement, *Which I consider under two General Heads.*

1 Head.

First, all inclosed, Severall Land, whether Meadow or Pasture.

2 Head.

Secondly, Common Lands, whether Arable or Grazing. First, Severall inclosed Lands I divide into three sorts, or else will rank them under three Heads.

1 First shall be our worst sort of Lands of what nature soever they be, from the value of one shilling per Acre, to Ten shillings; The Improvement whereof will fall under most of the six particular Pieces, it being capable of most and greatest Improvement.

2 Second-

2 Secondly, is our middle sorts of Lands, from the value of Ten shillings per Acre, unto Twenty, which falls naturally under the third Piece or way of Improvement, yet is capable oft times to fall under some or most of the other Pieces also.

3 Third shall be our richest Land, from Twenty shillings per Acre, to forty, and from forty to three or four Pounds an Acre; some of this sort will admit of very little or no Improvement, having all Naturall, and Artificiall experiments already made upon it, but some others of this richer sort will admit of a very considerable Improvement, and is principally discovered under the sixth Piece. Neither can I say that all Lands without exception of the two former sorts may be improved; For possibly, and out of question very much is improved already, and others may lie so void of any capacity of Improvement, that either there may be none at all, or else none that will raise such Improvements, as will well and sufficiently requite the charge and cost bestowed; but comparatively not much of this in *England*.

Only improve
upon great ad-
vantage

And my design is principally to hold onely forth possibilities of Improving at a far inferiour charge to the cost bestowed, and the Improvement made from such materials, as generally are lost, or little or no whit practised in most parts of the Land.

The second Generall are our common Lands, whether errable, constantly under Tillage, such as are our common fields, all the fielden or field Land throughout the Nation, of which there may be three sorts also, Bad, Better, Best of all, and all and every part thereof may be very much and manifoldly advanced, under some or all of the aforesaid Pieces; or else whether it be Commons or Commune of Pastures upon those great and vast Commons, called Heaths, Forrests, Moores, Marshes, Meades, or whatsoever of them, Those also may admit of a very great Advancement, and these Lands will fall familiarly under every Piece, according to their severall values, and capacities, but most especially under the third and fourth Piece, treating of Tillage, and Inclosure. And then I shall proceed to shew you the nature

of each sort of Lands whereby the Remedies will be most facile and easie in the application. And so I have ended the first General'.

The second Generall Head holds forth the severall meanes of Cure: Or the reducement of Land unto Fruitfulness and Fertility, discovered under the first Piece of Improvement of floating or watering Lands.

CHAP. III.

Shewes the first Cure or Remedy against Barrenness, and therein discourseth what Lands are most suitable to watering: And how to gain watering upon the same.



BEfore I discourse the same at large, I shall only say that there are severall Remedies against the said Barrenness, or divers meanes of reducing these Lands to their naturall fruitfulness, or to the Improvement of them to a more Supernaturall Advance than they were ever known to be.

To which I must premonish the Reader, that here lyeth all the Skill and Kernell, which being made forth in some good measure, I hope will give thee such satisfaction that thou.

thou wilt not onely vouchsafe me the reading and thy credit thereto, but also be a practioner therein; Which done with delight, will not onely produce the reall advantage here discovered, but far greater: For these things are, and may be brought to a greater height of Advancement, by how much the more Ingenuity and Activity is exercised in the Prosecution and Experimenting of them, and to a greater discovery by a constant familiar use of them, which is the true and reall end of his Discovery; and the Proverb herein best will hold; *The more the Merrier.*

The Cure followes now more largely.

ALL sorts of Lands, of what nature or quality soever they be, under what Climate soever, of what constitution or condition soever, of what face or character soever they be (unless it be such as Naturally participates of so much fatness, which Artificially it may be raised unto) will admit of a very large Improvement. Yet the fattest Land was, hath been, or may be bettered by good husbandry.

And such are the Lands that lye near or bordering upon any River, or small Brooks, your little Rivers, and Rivulets, admitting of greater falls and descents than your bigger Rivers do, which run more dull & slow, more dead and levell, whereby little Opportunity will be gained of bringing but little Land to so great advance by them, but where the greater Rivers can be gained over any Lands, there will the Improvement be the greatest, and the Lands made the richest, the greater Rivers being usually the fruit-fullest, having more Land-floods fall into them; But under your lesser Brooks may your greatest quantities of Land be gained, and your water most easily and with small charge be brought over greater parcels than upon greater Rivers.

Under great Rivers will be the best Land.

And under lesser the greater quantities and greatest Improvement.

For the discovering of such Lands as lie under this Capacity, you must seriously consider the Situation of your Lands; If your Lands be a little hilly, and your Brooks run more swiftly, more Lands may be brought under them: Also if your Lands lye more shelving or descending towards

the River, or any low descent whatever; that your water may fall off as fast as it cometh on, the quicker and easier will your Land be Improved, especially if your Land be sound, light, or gravelly: This is a most gallant opportunity, let your Lands be what they will, or of what nature soever, if it lie descending, the advance will be great enough, if you have either a constant stream, or Landflood.

And here let me (good Reader) advertise thee of one Piece of husbandry, most highly commended of most men; And truly so it is very commendable, and excellent, compar'd either with those that use none, or else neglect this where it may be done, which is this,

Setting water
on Pooles or
Lakes not so
excellent.

Many Gentlemen have assaid to water their Lands, by setting the Water in Pooles, Ponds, or Lakes upon them, and continuing it standing, and soaking many daies and weeks together; yea some practise it: although their lands have layen descending; and then draw their Sluces, or remove their stoppages, and drain away all their water again; to which way of flowing, I incourage all men rather than neglect all, and honour them therein; yet if they please to make experiment of the succeeding way of floating, they will easily let this fall; The excellency whereof consists in the speedy taking away the Water, as soon as it is brought on; And onely suffer it to run over, and so with all speed run off into some drayning Trench again: The Method whereof shall at large be handled, by which, such a concealed Advantage will be discovered, that men will wonder how they were so easily deceived, Wherein I shall be somewhat larger, because able men much differ both in their opinions of both waies of watering, as also in their manner of working the same.

In what Cases
to cover land
by Water.

My advise shall be, never cover thy Land with a standing Water, unless for a day or two, or else in case thy Land should be so Levell that it hath no descent at all, then better set the Water upon it, than neglect it, so thou be sure to drain it after one or two days standing, and then bring it on again, & take it off again, as aforesaid, yet it is impossible ever to produce the like effect, as it shall according to the

Chap. 3. *Reduement of Land to pristine Fertility.*

19

the subsequent directions; Because it neither receives the full fruit, or fatness of the water so fully and kindly, nor is grazable and feedable so soon, nor yet so richly as in the other kind of working.

2. After thou hast considered the Situation of thy Lands, as aforesaid, then search, and find out the lowest part of thy Lands, and there having found such a Levell or descent, as will lay all thy Lands dry again, as thou shalt have occasion to float them, which drain must be wrought 6 or deep, as that thou maist go under that corrupt feeding, or springy moisture, that breeds and feeds the Rush, Flag, and Mareblab, or else causes thy Land to turn Spewing, Morish, or boggy, which two Advantages, if thou hadst discovered, and found upon thy Land (which little Land in *England*, but hath one or both of them) come to the third Direction, and,

3. Therein consider seriously the nature of thy Land, which if it be cold, and of a sad Nature, moist and spewing, and lie very Levell, it will require then a very good Land-flood, or a constant River to overflow it, and other barren hungry Water will do very little good thereof.

But, if either thy Land be Gravel, or of a sound, warm, sandy, or mixed nature, and any whit descending, then any Running stream will have a gallant Operation. The warmer, lighter, and sounder is the Land, the greater is the Advantage. These particulars discovered, out of question thou hast a wonderfull advantage before thee, especially if thou hast any great length and quantity of Land along the River, or by a great Road-way side, or else hast any good Land-floods from great Towns or Cities, make as much of these Advantages, and prize them as thy Lands, for though hereby thou canst make thy Lands no more, yet thou mayst make them so much better, as thou canst desire.

Suppose some man of great credit should say, Sir, you have two hundred Acres in such a place, what if I should lay you a hundred more in the midst of them? he would wonder at it; yet because of the credit of him that spake it, he doth not wholly disdain it, and if it could be done, he

Boggy Lands
good for water-
ring.

deserved thanks for it; but he doth do it really, though not in kind, that advanceth or Improves the Land but one third part, that makes Two Acres as good as Three, much more he that makes One as good as Three, or Five, or Ten, as before this watering business be done shall clearly appear; & so I descend to the working out the same. I had forgot another sort of Land which is your Boggy Quagmire Land, no less capable of a mighty Improvement if it fall under the opportunity of floating, and by any whit descending.

CHAP. IV.

*Shewes how to work thy Land and Water; so
as to reduce it, and work out the Im-
provement promised.*



Herein a little consider of the way of both fitting thy Land to thy Water, & thy Water to thy Land, with the truest, naturallest, & properest Seasons for bringing it on, and taking it off, and thou shalt see an admired issue.

And being resolved that thou hast an opportunity upon thy Lands to make this Improvement out, Plot out thy Land into such a Modell or Platform as thou maist be sure that all thy Land thou designest to this Improvement, may not fail therein, I mean that all thy Lands thou resolvest to float may be under the true Levell of thy Water; And that this may be, I shall here discover to thee how to carry thy Water upon the Levell, that thou shalt lose no ground, neither carry it so dead, that thou canst not kindly work it, & this precisely observed, may be in stead of many Persian Wheels so highly commended by Mr *Gabriel Platt*, which Wheel is also commendable, & may be very usefull, where either no good falls can be gained, nor other waies the water cannot be raised to higher parts of ground you desire to water; The description of which Persian Wheel I hope to give thee before this discourse be ended; And also intend

in

in my Additions; if not where I describe & figure out the Persian Wheel, to discover a far better Engine, that shal with less strength raise a greater quantity of water for any use.

And now for the Method or way of working thy Water upon thy Land without this Wheel, which will require a double stream, one to drive it, and another to be raised, & without the charge of all other appurtenances to the said Wheel belonging, as Dams, Sluces, &c. and the maintenance of the same for preservation of this charge, and for the more easy working the Improvement.

Take a most exact Survey of thy Water, not by thy Eye onely, but by, and with a true exact Water Levell, which is an Instrument though plain and easy, yet rarely made nor used among us, which shall be largely described among other Tools in the tenth Chapter; then either begin at the over end, or neather end of thy Land, which thou pleassest, if at the over end, where the water first entereth into thy Land.

How to begin
the first piece
of watering.

And by thy Levell discover and plot out where thy water will go along thy Land, as thou goest downward, that so thou maiest lose no Land, that will easily be brought under thy water; Then cut out thy Master Trench or Water-course if thou pleassest to such a bigness as may contain all thy Land-flood, especially to bring it within thy Land, and so bring down thy whole Water-course together: But the most certaine way is, as soon as thou hast brought thy Water within thy Land, upon the superficies of it, then carry it along in a foot broad Trench or lesser all along thy Levell, which Water will be a great help, and a second and truer Levell than the other, and in thy working of it thou shalt find all little enough too prevent too dead a Levell, & yet lose no Ground neither: If thy Levell be too dead, the lesser stream will follow thee, so that a convenient descent must be minded also to give the water a fair and plaufible passage or current all along. And if thou discover in his lesser Trench, any mistake or tailing, then thou mayest with more ease and less charge amend the same easily by going higher upon thy Land, or lower towards the water, & stop up the same again (for thy Trench need be no deeper than
the

the thickness of thy over Turff) and cut out a new, and so thou mayst most certainly demonstrate where thy main work shall go without hazard, which will be a great certainty, and little loss.

This done, thou mayest cut out thy water-courfe, and be sure it be large enough to contain the whole Water thou needest or intendest, and so thou have longitude or length of ground, the Trench must be the broader, not the deeper, for a shallow Trench is best for this work. And when thou hast brought it so far into thy land, as thou hast any land to work upon, thou mayst a little narrow thy Courfe as thou seest the quantity of thy land, or water requires, & so far as thou wouldest have thy courfe float over all at once, thou must cut thy trench narrower & narrower, all along to the neather end, that so without stops and staies it may flow all along at once, the Trench being narrower and narrower, that Water that comes within the Trench when it is wider must needs be thrust out when the narrower cannot contain it; for here is the true excellency of this sort of Trenches; and thus should all thy floating Trenches be made in every work.

As soon as thou hast brought thy water upon thy Land, and turned it over, or upon it, then as aforesaid, be sure thou take it off as speedy as possibly, and so fail not to cut out thy work, so as unless thy Land bee very found, and thy Land-floud very Rich, thou must take it off the sooner by a deep drayning Trench, therefore I prescribe thee no certain breadth betwixt floating and drayning Trenches, but if thy Land is sounder and Drier, or lieth more Descending, thou mayest let it run the broader, and as the Land is Moyst, Sad, Rushey and Levell, let it run the lesser breadth or compass; And for thy drayning Trench it must bee made so deep that it goe to the bottom of the cold spewing moyst water, that feeds the Flagg and Rushe; for the wideness of it, use thine own liberty, but bee sure to make it so wide as thou mayest goe to the bottom of it, which must bee so low as any moysture lyeth, which moysture usually lyeth under the over
and

How to make
the drayning
Trench.

and second swarth of the Earth, in some Gravell or Sand, or else, where some greater Stones are mixt with clay, under which thou must go half one Spades grafe deep at least: Yea suppose this corruption that feeds, and nourisheth the Rush or Flagg should lie a yard or four foot deep, to the bottom of it thou must go, if ever thou wilt drain it to purpose, or make the utmost advantage of either floating or draining, without which thy water cannot have its kindly Operation: for though the water fatten naturally, yet still this Coldness and Moisture lies gnawing within, and not being taken clean away, it eats out what the Water fattens. And this also I must desire thee seriously to observe; that as soon as thy Water hath spent it self, and the Earth or Grass hath exhausted and drawn out of the Water her strength and richness, then how long soever it runs longer and further, it prejudiceth and corrupts it by breeding the Rushes in abundance: The water running trickling among the Grass, and upon the Earth, leaving her Thickness, Soyl or Filth, which I call Richness, among the Grass, and upon the Earth, and it self runneth away into the drayning Trench, and troubles thee no more, and so the Goodness of the Water is as it were Ridled, Screened, and Strained out into the Land, and the Leanness slideth away from thee, which can never be done, neither so speedily, nor so purely, by standing on Lakes or Pooles, besides the loss of the Grazing, which may be near as good in Winter as in Summer, upon a good Land-flood or rich Waters.

Shewes how the water is fruitfull.

G

CHAP.

CHAP. V.

*Shewes the cause of water its fruitfulness,
and the proper season of wa-
tering Lands.*



Rich Land-flood is ever the washing down of great Road wayes, Common Fields, under Tillage; or else from great Towns, Houses or Dung-hills; The riches whereof is unvaluable.

Consider the goodness of thy Water, if thy Water be a rich Land-flood, or a lusty gallant Stream, it will run further and wider upon thy Land with life and fruitfulness; If lean, thin, and onely from Springs and Herbs, or green soard, tis more barren, and so will operate upon less Lands; so that as I said before, thou must well observe both Land and Waters suitableness, and so increase the latitude or breadth of thy Land thou intendest to improve with that stream, before it fall into his Drain; Which Drain thou must dig, or make straight down as it were by a Perpendicular plum-Line, which will drain the best of all; Or else thou mayest make thy Drain, or Trench, somewhat Taper (viz.) Narrower and Narrower downwards, which will keep open the best, and continue longest, and for the Widness of it, that must be resolved both from the nature of the ground, which if Sound, and Dry, will require the less, but if Moist and Boggy, the Greater and Deeper; or else from the quantity of Water it is to receive, that so it may carry it all away plaussibly within it self, & for the drayning Trench be sure thou endeavour to carry it as near upon a straight Line as is possible, the Reason shall afterward appear: This work is of more advantage, and more to thy profit than thou imaginest, but thy exercise therein will teach thee more.

How to make
the Drayning
Trench.

The best flow-
ing season.

Thou must also well consider the proper seasons of the year, bringing on thy water, which is in the beginning of Winter

Winter, when Grass groweth least, and begins to fall, and is clean eaten off thy Land, all Winter long is very seasonable for this work; and the best season to take it off, is in or about the beginning of *March*; thou maiest make what Improvement almost thou desirest also upon thy moyst, cold, Land, if thou observe the directions given.

Upon moist Land.

But for thy warm sound Land thou maiest continue thy water, and keep it working upon thy Land, almost all the year round, Provided that thou keep it not too long upon a place, for thou must be sure to have an especiall eye, that thou soak not thy Land too much, that Cattell treading, or Grazing upon it, soyl it not, for then the Rush will come upon thee, and it will overgrow thee, and exceedingly prejudice thy hopes, (mistake me not) I speak not here to advise thee to continue thy water thus long upon one place, but be ever removing it from place to place, but especially to shew the proper seasons to make use of this Piece of Improvement.

Upon warm Land.

Thou hast also another great advantage hereby, having water drawn over thy Land, thou art in such a Capacity that in case of drought in time of Summer, thou needest not to fear it, thou mayst now and then wet over thy Land in the heat thereof, when Grass if it have but Moysture, will grow far faster in so hot a time than any, but be sure not to soak thy ground too much; Keep thy Land rather in a thirsting condition, not glutted ready to spew it up again, for maiest thou preserve thy Land green, and fruitfull, when others are scorched all away, Then may a weekes Grass or a Load of Hay possibly be worth Three, or Four.

A double Advantage of having a water course cut out.

I my self by these opportunities, have cut twenty four Load in a Meadow, where I cut but five or six the year before, when Hay sold at a great value; The directions exactly followed, I will lose my Credit if thou fail of the effect promised.

President of one year cutting but five or six and the next twenty four.

And for thy encouragement, I will give thee a president or two: Certain Acres of light, sandy Land, were taken for a Term of one and twenty yeares, at the value of one shilling six pence per Acre, and that was more than it was worth,

President of a sandy Land.

a little Brook with a Land-flood, issuing out of a Common Field, was brought over it, the Land levelled, and made fit and even to receive it, for it was very Irregular, and of great high Ridges and Furrows before (after the manner of that Country) and after two yeares working, thirty shillings an Acre would have been given for it, (I my self offered it, and some of that Land also was my own, but it was refused) being wrought just by the aforesaid Directions. I have made the like Improvement my self upon Lands of the same nature, to as great advancement as is here spoken off, too tedious to discourse. *M. Plat* also in his book, produceth a president of Lands, Improved by Water, with the charge of three hundred shillings, to be worth three hundred pounds *per annum*, but what it was worth before the three hundred shillings were expended upon it, he saith not, but no question, very great Improvement, I believe it was.

Mr. Plat's President.

President of Boggy Lands.

As for Boggy Land also, I have recovered severall Pieces next to plain Quagmires: The means of reducing whereof shall be discoursed by themselves in the next Chapter: So bad and boggy it was that Cattel could not Graze upon it out of danger; And indeed it bore nothing but Cattayles; And by this course I recovered it to perfect soundness, and made it worth betwixt thirty and forty shillings *per Acre*, and so dare undertake the like where ever, lying under the aforesaid Capacities. Many more presidents of this nature are visible in many parts of this Nation, Some as great Improvements as these, Some lesse, and yet very great; And all done without any other Cost or Expence of charge, in any other materialls than Poor mens labours: Which to me is a second argument of Incouragement, to promote all works of this nature under these Capacities. One thing more I pray thee observe, that though it be the common practice of most men in drayning their Land to make many shallow Trenches of about one foot deep, and lay their Mould on heapes, that so they may spoil put little ground, both which I must necessarily reprove as ill Husbandry. For though I am all for Floating, and Drayning, which will necessarily occasion many Trenches, yet I am an Enemy to this

Too much Trenching is madness

this ordinary and usuall way of Frenching; first for so many Trenches, I conceive no need in these works, nor upon any Land whatsoever, but something more of them, more seasonably in the second Piece of Improvement to be handled.

CHAP. VI.

Sheweth the true Artificiall making of the Floating Trench, and how to Levell Land, and the suddaine way to Soard it.

Usuallly I shall advise, to make not above Two, or Three materiall Trenches, having first taken up thy Turf, just under the Grass rootes, both thin and square, and as broad as can be taken up, which I exceedingly prize for many uses, and preserve. The one called a Flowing or Floating Trench, wherein I carry my water: which usually after I have brought my water where I intend to work it, I carry it in a Trench seldome above one foot deep, or a foot and half, & many times not above eight, or nine inches deep: that so it being made Artificially, (*viz.*) so Level & taper, & Narrower and Narrower, as aforesaid, the further it goes, that it may so cast out the water, that it may flow over the same for a furlongs length at once, which is the Excellency of it; And then another drayning Trench running parallel with this, or Two if the Land lye very flat, and of such a depth as it may not onely receive all the water that Floweth over the Land clearly, but that it may also drain away the cold Moysture and Bogginess that offends the Land, by breeding either Rush or Bogg, and of such a latitude, or breadth, from my floating Trench, as thy water is of strength to Improve, without Prejudicing of it, by breeding Rush, Flag or filth, as aforesaid; And as I make not many Trenches, so I shall fill up all others that are not serviceable to these, and so have

There are two sorts of Trenching.

Manner of making the floating Trench.

A shallow
Trench doth a
certain hurt
and uncertain
good.

How to pre-
vent heaping
Earth, and in
evening the
ground.

done many a one, that others have made to Drain their Land withall, and with this One or Two Draines cast out, in the lowest part of my Land, layed dry more Land than a hundred of these common Trenches would, for a thousand Trenches made above the Corruption that feeds the Bogginess, or Rushes, never Drayner, or takes away the cause, that the effect cannot possibly cease. As for heaping the Earth, and moyling the ground, that I also conceive may be prevented by maintaining one Horse and Cart, and sometimes a couple of Wheel-Barrowes, or a double Wheel-Barrow with two Wheels, made big enough for two men to wield, or a little Cart made with two little Wheels, and another lesser than them by half, to bear it at a constant pitch to fill, which may be so made, that either with two men or a horse you may carry away a great weight with much speed, and shift it horse and man at pleasure, which shall be described at large in the shadow of it in the Tenth Chapter of Trenching tooles, and into them I cast my Mould, as I digg or cut out my Trench, and so carry it away when I first digg it, either into some old Trench or hollow place, and there lay it, and then take my Turf, which I took up in all my other Trenches, and cover over that Earth, and there will be as good Soard that year, if it be laid before February enter, as in many parts of the Field beside; And so shall save both the labour of removing my heaps afterward, and the spoyling of so much Land as they would cover. And for the better carrying on this Improvement by Water, if thy Lands be either Hilly or Banky, or lye high Ridge or Furrowes, upon which thy water will never work kindly, rake a Direction or two for the more easie Levelling of the same (how to levell or plain Lands for watering most easily, and Artificially) which thou mayst doe either of these two wayes, Either of which I cannot more especially commend unto thee, thine own Experience will demonstrate that.

How to Level
Land.

The first is levelling by the Plough, which thou mayst do by two or three blowings and gain o' Crop also if thou rather affect it, herein thou wert best to begin about the latter end
of

of September first to plough thy land, which I advise to cast as most men do a Fallow, and then in the beginning of December, be sure to give it a second plowing, just overthwart all the Lands, and so cut the Turf, that the Soard may have all the Winters frost to wrox, and moulder it, which towards March thou mayst plow again, and so cast it or raise it, as thy Land requireth, to bring it most even, and levell, and if one more plowing will not do it, then thou must do more, and Harrow it also, to draw down high places, and fill up Valleys, and if it yet be too irregular, and some places so high that the Plough and Harrow will not bring them down, thou must get some Labourers, with their Spades, and take down those places, and cast them into Regularity. A Labourer with a Spade upon this wrought Land will do abundance in a day; but be most Exact and curious in Levelling thy Land, it brings more Advantages than thou art aware of, or I have time to shew: And then about the middle of April, sow thy Lands with such seeds as are more suitable to the nature, and richness of it, but sow it not too thick by any means, nor too thin neither, but the thinner is thy Corn, the stronger it will be, and the more grass will grow among, which will help thee more in the Soarding of it, than hinder thee in the Crop of it, which Crop may pay a considerable summe towards this Charge; But if thou desire a more speedy Soarding of it, and hast no respect to the present profit nor charge, in respect of a suddain dispatch of it, then as before, so soon as Grass begins to stand at a stay, and growes but a little, plow thy Land a thin broad furrow, exceeding exact, and true, or rather say it, or take off thy Skin or Turf with a very broad whinged or tusked share, as broad a Furrow as thy Plough will carry; and as soon as thou hast plowed it, cut it all at such length, as thy Turf may hold taking up, and heap thy Turf speedily upon the next Land, and then plow thy Land again and cast it down, and if it lye exceeding high, cast it twice, and then two men with their Spades will levell any uneven Hill or Ridge most easily, and thou mayst either with the Plough or Spade, or both,

Plowing to Levell.
Spade to help Levelling.
The speediest Soarding of Land.

im-

immediately bring it flat, and pursue the work with all violence, the Turf being taken up, speed thy levelling with Plough and Spade, that so thou maiest be suddenly ready to lay down thy Turf again, and then take this Turf, by all meanes before the Grasse be killed, or lose the colour, or deaded, and lay it down as thou plowedst it up, every Joynt meeting and closing as even as thou canst possibly, and expect how much soever thou canst make plain, and Levell before *February*, thou mayest reap great fruit, or a good Crop of Grasse that Summer, especially if thou hast Water to float it withall, and when thou hast done One Land, then thou maiest remove thy Furrowes, or Turf, to that thou hast levelled, and work that Land accordingly as the other, and then Turf it also, and so goe forward throughout thy Field one after another.

Levelling Land
by the Spade.

Some others have levelled all by the Spade, and by that means they have, or may more certainly mix their hungry Land, and fat Land more equally, and lay it down all alike hereby, which course also I very well approve, and if a man have very good Toolles, and Irons made on purpose, one to cut out his Turf, and another to take it up square, and even, as big as it will possibly hold to take up, or a man can easily raise with his naturall strength, which Toolles are hereafter to be discoursed in the Tenth Chapter, he may very near dispatch as much, as otherwise is directed, if the Land be very uneven. I have had a man hath taken up Turf all day long near two foot square, if not above, and heaped the same, and three other men have followed, and levelled, and he hath also laid and planted down the same as fast as they could levell it: You cannot possibly beleeye how fast work will goe forward, with true Artificall Toolles made exact to every purpose, and how much delight men will have to work with them. And if thou wilt be curiously Exact indeed, thou maiest after a Shower, or after thy Land is once soaked, or thoroughly wet thorough, get two or three broad Beaters made of a Plank betwixt two or three Inches thick, fourteen or fifteen Inches long

A present
what one man
hath done at
Turffing and
Levelling
Land.

long, and about nine Inches broad, with a good strong Stail put into, or near the middest of it, with which beat over all thy Land; one lusty Labourer will goe over a great deal of Land, and it will lay it curiously and even, and very delightfull to the eye, and suitable to the Water working.



And having brought your Land thus leuell, then your water will work most gallantly, and even, Floating every place Proportionably, which you must take special care of, & not suffer it to run a whole Stream over some, and scarce discernable over other parts, but be sure every where alike, and when you have your water over your Land, that it run over it with a constant thin Stream, it will Improve fast enough, for soaking water breeds the filth, which you must avoid as the most Pestilent Enemy to this Husbandry.

H **The**

The second Piece of Improvement containing the Drayning, or Reducing of Boggy Lands to sound Pasture, is further discoursed in the Chapters following.

CHAP. VII.



Herein is to be handled Drayning, or taking away Superfluous and Venomous Water, which lyeth in the Earth, and much occasioneth Bogginess, Miriness, Rushes, Flags, and other filth, and is indeed the chief cause of Barrenness in any Land of this nature. Something I have already spoken as to Bogginess, that lyeth under a Capacity to be floated with Water, either River or Land-floods; in the Reducement whereof, you must precisely apply your self to all Parts of the former Chapter, for bringing your Water upon your Land, and working it also, and taking it off again; Especially that your Drayning-Trench or Trenches (for possibly in this sort of Land more may be required, according to the nature of the lying of your Land, if Uneven, and full of Dales, and Vallies) be made one Spades graft or pitch below the matter of the Bog, I mean the Spring, for so it is; which must be clearly Drayned, which I cannot too oft remind you of; But now I onely speak to those Lands which are from under such a Capacity of floating with Water; And are onely such as are covered with constant Water, and Lakes, or else the Boggy, Miry Lands, it self, and have no River, or Land-flood to be brought over them, and the remedies being equally applicator

applicatory to both for the most part, I will propose generall remedies. I say that Drayning is an excellent and chiefest meanes for their Reduement; and for the depth of such Draynes I cannot possibly bound, because I have not time, and opportunity, to take in all circumstances, therefore in generall thus.

Be sure thy Draines be such, and so deep, as thou hast a descent in the end thereof to take away all thy water from thy Drayn to the very bottom, or else it is to no use at all; for suppose thou make thy Drain as high as an house, and canst not take thy water from it, thy work is lost; for look how low soever is thy lowest levell in thy Drain, thou mayst drain thy water so low, and not one haire breadth lower will it drain thy ground than thou hast a fall or descent to take it cleanly from thy Drain; therefore be especially carefull herein, and then if thou canst get a low descent from thence, carry thy Drain upon thy Levell untill thou art assuredly got under that moysture, mirnesse, or water, that either offends thy Bog, or covers thy Land; and goe one Spades graft deeper by all meanes, or thereabouts, and then thou needest not tye thy self precisely to a dead Levell, but as thy ground riseth, or as the moysture lyeth higher, so mayst thou rise also, so that thou keep one Spades graft as aforesaid under it; and that thou mayst not fall herein, observe that in Cold Rushy Land this moysture or cold hungry water is found beneath the first and second swarth of thy Land; and then oft-times thou comest immediately unto a little Gravill, or Stoniness, in which this water is, and sometimes below this in an hungry gravell, and many times this Gravell or Stoniness lyeth lower as aforesaid; but in Boggy Land it usually lyeth deeper than in Rushy, but to the bottom where the spewing Spring lyeth thou must goe, and one spades depth or graft beneath, how deep soever it be, if thou wilt drain thy Land to purpose. I am forced to use Repetitions of some things, because of the suitableness of the things, to which they are applied; as also because of the slowness of peoples Apprehensions of them, as appeares by the non-practise of them, the

How to make thy Drayn to purpose.

Where water lyeth in Rushy Land.

which were ever you see drayning and trenching you shall rarely find few or none of them wrought to the bottom.

The matter
that feeds the
Bog, where
that lyeth.

Every Bog
hath most cer-
tainly a living
Spring with'in
it.

And for the matter or Bogg-maker that is most easily discovered, for sometimes it lyeth within two foot of the top of the ground, and sometimes and very usually within three or four foot, yet also some lye far deeper, six, eight, or nine foot, and all these are feazable to be wrought, and the Bog to be discovered, but not untill thou come past the black Earth, or Turf, which usually is two or three foot thick, unto another sort of Earth, and sometimes to old Wood, and Trees, I mean the proportion and form thereof, but the nature is turned as soft, and tender as the earth it self, which have layen there no man knows how long, and then to a white Earth many times, like Lime as the Tanner, and white-Tawer, takes out their Lime-pits, and then to a Gravell, or Sand, where the water lyeth, and then one Spades depth clearly under this which is indeed nothing else but a spring that would fain burst forth at some certain place, which if it did clearly break out, and run quick and lively as other Springs do, thy Bog would dy, but being held down by the power and weight of the Earth, that opposeth the Spring which boyles and workes up into the Earth, and as it were blowes it up, and filleth the Earth with Wind, as I may call it, and makes it swell and rise like a Puf-ball, as seldom or never you shall find any Bogg, but it lyeth higher and rising from the adjacent Land to it, so that I beleve could you possibly light of the very place where the Spring naturally lyeth, you need but open that very place to your Quick-spring, and give it a cleave vent, and certainly your Bog would decay, by reason whereof it hath so corrupted and swoln the Earth, as a Dropsie doth the Body, for if you observe the Mould, it is very light, and hollow, and three foot square thereof is not above the weight of one sellid foot of naturall Earth, Clay, or Land, whereby I conceive that how much soever this Mould is forced from the naturall weight, or hardness of solid Earth, or Clay, so much it is corrupted, swoln, or increa-
sed.

fed and blown up; and so much it must be taken down; or let forth, before ever it be reduced; I therefore prescribe this direction, (*viz.*)

Go to the bottm of the Bog, and there make a Trench in the sound ground, or else in some old Ditch, so low as thou verily conceivest thy self assuredly under the Levell of the Spring or spewing water, and then carry up thy Trench into thy Bog straight through the middle of it, one foot under that Spring or spewing water upon thy Levell, unless it rise higher, as many times the water or Spring riseth as the Land riseth, and sometimes lyeth very levell unto the very head of thy Bog, unto which thou must carry thy Drain, or within two or three yards of the very head of it, and then strike another Trench overthwart the very head both wayes, from that middle Trench, as far as thy Bog goeth, all along to the very end of it, still continuing one foot at least under the same, and possibly this may work a strange change in the ground, of it self, without any more Trenching,

Shewing how every Drayn must be carried up from the lowest levell.

But for these common and many Trenches, oft times crooked too, that men usually make in their Boggy grounds, some one foot, some Two, never having respect to the cause or matter that maketh the Bog, to take that way, I say away with them as a great piece of Folly, lost labour and spoyl; which I desire as well to preserve the Reader from, as to put him upon any profitable Experiment: for truly they do far more hurt than good, destroy with their Trench and Earth cast out, half their Land, danger their Cattell, and when the Trench is old it stoppeth more than it taketh away, & when it is new, as to the destroying the Bog it doth just nothing, onely take away a little water, which falles from the heavens, and weakens the Bog nothing at all, and to the end it pretends is of no use, for the cause thereof lyeth beneath and under the bottom of all their workes, and so remaines as fruitfull to the Bog as before, and more secure from reducement than if nothing was done at all upon it.

Shallow Trench reprehended.

The most sure way to destroy a Bog.

Or thus thou mayst work it some what a more certain way,

way but more chargeable, (*viz.*) After thou hast brought a Trench to the bottom of the Bog, then cut a good Substantiall Trench about thy Bog, I mean according to the form of thy Bog, whether round, square, or long, or three or four yards within thy Boggy ground, for so far I do verily beleve it will Drayn that which thou leavest without thy Trench at the depth aforesaid, that is underneath the spring water round; And when thou hast so done, make one work or two just overthwart it, upwards and downwards, all under the matter of the Bog, as is aforesaid, and in one yeares patience through Gods blessing, expect thy desired issue; and if it be in such a place as will occasion great danger to thy Cattell, then having wrought thy Works, and Draines as aforesaid, all upon straight lines, by all meanes, prevent as many Angls, Crookes, and Turnings as is possible, for those will but occasion stoppages of the water, and filling up of Trenches, and loss of ground, and much more trouble than otherwise. Then thou must take good green Faggots, Willow, Alder, Elm, or Thorn, and lay in the bottom of thy works, and then take thy Turf thou tookest up in the top of thy Trench, and Plant upon them with the green Seard downwards, and then fill up thy works level again, untill thou come to the bottom or neather end of thy work, where thy Trench is so shallow, that it will not indanger thy Cattell; or rather take great Pibble stones or Flint stones, and so fill up the bottom of thy Trench about fifteen Inches high, and take thy Turf and plant it as aforesaid, being cut very fit for the Trench, as it may joyn close as it is laid down; and then having covered it all over with Earth, and made it even as the other ground, wait and expect a wonderfull effect through the blessing of God; but if thou mayst without eminent danger leave thy workes open, that is most certain of all. I might make more particular Application of the premises to the drowned and covered parts of the Fens and Marshes in the next Chapter, upon which they will have such an Operation, as to reduce them to perfect Pasture, and to great profit, and to all sorts of such natured Lands, thou mayst apply them

The prejudice by crooks and angles in water courses.

How to make Draynes without any prejudice to any sheep or beast

The best way of preventing danger to Cattell in Drayning.

Fens and Marshes recovery.

and save me much labour, being the main meanes of Fen Drayning. As for Sluces, Flood-gates, Waires, and Dams, are but secondary meanes, and being the proper work of an Engineer or good Carpenter, I shall say no more for brevity sake. But if thou canst by any meanes make thy self capable of bringing any constant Stream or powerfull Land-flood and Water, and constantly Flow over the same, as in the former Chapter, that will reduce it to a greater Advance, and work the most certainest destruction to the Bog of all, as I have before declared by Experience.

Flowing best
destroys a
Bog.

As I conceive, the Bogs in many parts of the Nation were occasioned thus: wherever is a Bog, I am confident was formerly a Spring, which Spring running and venting it self, kept the Land round about it sound and dry, as where most clear Springs are at this day; but the said Spring stopping up, either with leaves, or Cattels treading, or wood falling upon the same, or other filth (for I believe many, or most parts of this Land was very woody in former Ages) the Spring was stopped that it could not clearly vent, and so being a Living water, would not be suppressed, or buried, but swells and boyles up into Bogginess, and so vents it self by little and little in a greater Compass of Land, because it cannot break forth clear together in a lesser, because of the pressure and weight of the Earth upon it, and this is the most naturall cause thereof that I can gather; And my Reason is this, In many Bogs (I will not say in all) I have found great Pieces, or Boughes, or Bodies of Trees lying in the bottom of the Bog. Four or Five foot deep, in the full proportion of a Tree or Bough, as it fell in, but when you come to take it up, you may cut it with your Spade just as as you do your Earth, and it goes to Earth, but how this should come so low, and lye so deep, and so familiarly in Lands of this nature, and not as frequently upon sound Lands, I cannot conceive otherwise than as aforesaid.

The probable
occasion or
first cause of
Bogginess.

CHAP. VIII.

*Answereth severall Objections made against
the Probabilities of so great Advance
by Floating.*

Ob.

These are but
pretences.

Ans. 1.



T may be some will still object and say, that these Affirmations are but Pretences, no such Advantage or ease as is promised can possibly be perforced.

But I say again, many Gentlemen can witness the truth hereof, Many Lands can shew it, and if thou wilt not beleve Relation, beleve thy eyes, go and see; he who prints my Book, shall be inabled to direct thee, where thou mayst see more than here is affirmed.

2.

Again, in many of the Wood-Land parts in this Nation, as in *Worcestershire, Warwickshire, Staffordshire, Shropshire,* and *Wales-ward,* and *Northward,* there are many more Improvements made upon coarse lands, than is in other parts upon better Lands; and the Improvements made in the Wood-land-parts speak out the truth hereof, much whereof being most Barren of all lands, is improved so high, as that it is at present as rich as many parts of the Fieldon, and fuller of wealthier Inhabitants; I am confident more rich Farmers of late years than when their lands were naturally more Rich and Fertile. I give not all, nor all sorts of Prejudents of Improvements I could by far, but onely a few here and there to quicken thy desires after them, the Experimenting wherof will bring more to thee, if not bring thee to them. These things I know of my own knowledge.

Watering
breeds the
Rush.

Another he objects that it will breed the Rush, the Flag, and Mareblab, and so this floating land shall be more prejudiciall than advantagious.

I answer, its true possibly, and easily it may, as I have shewed before, but be thou carefull of my directions, consider thy Land if it be dry and found, and thy water if it be Fat and Rank, and make the drayning Trench as afore directed, and never fear it, all the Difficulty is in the cold Land, and Barren Water, on which also observe punctually my Directions, and I'll warrant it; Make thy Drain deep enough, and not too far off thy Floating Course, and water it with a good force of water, and observe the seasons, which are, all the cold Winter when the Rush groweth not, It must have warmth to exhale, and draw it out, and be sure to lay thy Land sound and dry, by the Drayning Trench, that it may drain under that Moysture, Filth, and Venom, as afore-said, that maintaiues them, and then beleeeve me, or deny Scripture, which I hope thou darest not, as *Bildad* unto *Job*.

Ans.

Especially season for watering Land.

Can the Rush grow without Mire, or the Flag without Water? Job 8. 12.
Or. That Interrogation plainly shewes, that the Rush cannot grow the water being taken from the root; for it is not the moystnes upon the surface of the Land, for then every rain should encrease the Rush, but it is that which lyeth at the Root, which drained away at bottom, leaves it naked and barren of relief. But suppose it should breed some few (and the Mareblab too,) which is a sign thy Land begins to futen, then take thy whole Stream, or a good considerable stream, and bring upon that place, and overflow it, as is afore directed in the Third and Fourth Chapter, in *December* and *January*, if it take them not away, I will doe it for thee; Floating Land will as certainly destroy the Rush, the Flagg, and Martblab (being well drayned again) as work the least Improvement, and no Land richer than Watered Meades.

A sign when Land begins to futen.

Thou wilt say, many men have made great Experiments this way, and done great works, and cast up all again; Either the profits would not answer the charge, or else it would hinder some other Lands advance another way, or else could not bring their Land to their desired Improvement, or else do so little as was not worth their labour.

Obj.

Many have done great things herein and away to no purpose.

I had hoped that I had laid down such undenyable grounds and experiences, as would have removed all those Objections; but sith they are made, have patience, and I will return a particular answer to each clause of the Objection.

1. I say, were all this true, as possibly it may in some men, and in some parts, yet be not discouraged because of what I have said, and the Experiences made are also obvious, and in the view of them thou shalt see more advantage made than is here affirmed.

Mountebanck
Engineers Pro-
jections.

Mysterious En-
gines rep o-
wed.

2. And secondly to confirm thy Objection, I say, We had some Mountebancks abroad that have held out specious pretences of wonders, as many Engineers have done in drawing Water, or drayning Lead-Mines, Tin, or Cole-Mines, and to that purpose have projected Engines with double, treble, and fourfold Motions; conceiving and affirming, every Work, or Motion, would multiply the ease in raising the water, but not considering that certainly it must multiply the weight and burthen thereof, and also put such an Impossibilitie unto Tackles, Gears, and Wheelles for holding, that all would flie in sunder at the very first motion, and continually one thing or other out of order, and snap in sunder as fast as amended, because of the great strength is required to move the same; mistake me not, I do not here reprove the use of Engine Work, a good Engineer is a gallant and most usefull Instrument in a Common-wealth, and they have principles most able to make the best Husbands and Improvers, I onely warn you of Imposters: Engines are most necessary, and easeth all our burthens, and all our pondrous massie substances are or may be lightned thereby; and a good Engineer in these dayes hath taught us the usefulness of them, little lesse necessary than our very wel-being; but those few Instruments here held forth are plain and simple, and my Projections nothing but Country Experiments, that I fear the plainness of them will be no less offensive, they being onely to give a moderate ease and speed to so toylsome and costly labours.

3. I answer thirdly, that many have made some Experiments,

ments, but those I conceive have neither been full Experiments in all particulars, nor Regular according to the particular directions here given; And so may as well spoil all, as he that takes all or most of the Ingredients in a Medicine, and applies it to the Disease prescribed, but either he misseeth in the Composition, or else in the Application; or else if he be right in all, he may fail for want of patience to wait the issue, but casts all away as worth nothing, and claps in with another Receipt, and so is able to give no positive resolution what the effect thereof might be. Therefore I say as before I have said, Trace me along in all particulars, and fail in none of them, and if the issue fail, challenge the Author as a deceiver.

4. And that I may answer the full charge, I say, take my counsell for the severall Tooles proposed, and I question not that in most ordinary Works, the charges shall not be any proportion to the profit. But say an Acre of Land should cost thee forty shillings the sitting and preparing of it, as possibly some may it may lye so irregularly, 'tis then as possible in two or three yeares time, the same may be made worth forty shillings *per annum*; yea more, many other Acres thou maist work to as good an advantage for twenty shillings, some for ten shillings, some for five shillings, and some less; I could give the particular Experiments for them all, were it more necessary than brevity, which I so much affect, and resolve.

And for prejudicing other Lands, as many strongly object, it is almost as if one Hive of Bees should prosper more in one Garden than twenty would; the contrary Experience constantly manifesteth, and so I have done with this improvement. And for improving so little as it is not worth the labour, that is as frivolous also. Many score thousands of Acres in *England* are under this Capacity, and may be reduced to a twenty or thirty fold improvement; yea in some parts of the Kingdom, some hundreds of Acres together may be wonderfully advanced this way to a proportionable Advantage; and with less charge proportionably than a few.

*Object.
Answ.*

*Object.
Answ.*

Marsh Lands.

The first Fen-
drayne's or
Levellers
highly to be
honoured.

Invention far
harder than an
Addition to it.

Cutting water-
courses straight
no small an-
vantage.

There is also much Boggy and Miry Land that may be reduced to advancement, and such capacity as some may lye under may be improved twenty fold or more. And as for coarse Fen and Marsh Lands upon both Fresh and Salt waters, there have been such gallant notable Achievements, by many Accurate and Ingenious Spirits, to whom the Nation oweth high Acknowledgements, and whose works and experimentus I do admire and honour, to whom I desire to be a Pupil: Yet notwithstanding their Discoveries, and their works, cut forth throughout the Nation, and left to idle Practitioners, and Slothfull impatient Slubberers, who have not onely done it by the halfe, but stifled many a gallant plotted Opportunity of a far greater Advance than it hath produced; And so possibly in many parts of the Nation there may be great Reparations of these Ruins, and a certain Reducement to high Advantage; As also some Addition possibly to their Modell, or some increase to their Beginnings, which is acknowledged far easier than the first Projection, and shall be discoursed at the latter end of this Chapter.

The last way of Improvement of these sorts of Lands, prejudiced by water, is a way appliable to every other sort of Land whatever, which lye under that Opportunity, or Capacity, which is cutting straight the water-courses of little Brooks and Screames that run many times in spirall lines, and sometimes circularly, as they would make the figure 8. and so lose as much more excellent Land as need be, nay in some places twice or thrice as much; besides these Angles, Triangles, and almost Squares, and Circles, much endangering Cattell, by goaring, rushing, and thrusting them in, and also makes such stoppages, and oppositions to the water, that hinders the Current of it, and occasioneth it to lye soaking on the Land, that it either breedeth Rust, Flag, or Mareblab: Also the aforesaid directions is a great means of laying sound much Land overcome by Bogginess, the water lying so upon it, that it drowneth or stiflith a great part of the fruitfulness of it, yea, suffocath and choaketh others also bordering upon it, no small prejudice to the

the Nation in generall, and to many Town-ships and persons in particular. A straight water-course cut a considerable depth, in a thousand parts of this Nation, would be more advantageous than we are aware of, or I will task my self here to dispute further. And though many persons are interessed therein, and some will agree, & others will oppose; one Creek lyeth on one side of the River, in one Lords Manor, & another lyeth on the other side, & divers men own the same, why may not one neighbour change with another when both are gainers? If not, why may they not be compelled for their own good, and the Common-wealths advantage? I dare say thousands of Acres of very rich Land may hereby be gained; and possibly as many more much amended, that are almost destroyed; but a Law is wanting herein for present, which I hope will be supplied if it may appear Advancement to the Publick; for to Private Interests it is not possible to be the least prejudice; when every man hath benefit, and each man may also have an equal allowance, if the least prejudiced.

Many thousands of acres recoverable with little charge to man's sold advantage

But a word or two more, and so shall conclude this Chapter, and it is a little to further this Improvement through a great destruction (as some may say) it is the removing or destroying of all such Mills, and none else, as drown and corrupt more Lands than themselves are worth to the Common-wealth, and they are such as are kept up, or dammed so high, as that they boggye all the Lands that lye under their Mill-head; such Mills as are of little worth, or are by constant great charges maintained, I advise to be pulled down; the advance of the Land, when the water is let run his course, and not impounded, will be of far greater value many times: But in case the Mills should be so necessary and profitable too, and far more than the Lands they spoil, I shall then advise, that under thy Mill-dam, so many yards wide from it as may prevent breaking through, thou make a very deep Trench all along so far as thy lands are putrified, and thereinto receive all the issuing spewing water, and thereby stop or cut off the feeding of it upon thy meadow, and carry it away into thy back-wa-

Some Mills destroy more than they are worth.

To prevent corrupting land by a Mill-dam as much as may be,

ter or false course, by a deep a Trench, cut through the most low and convenient part of thy Meads: But put case thou shouldst have no convenient fall on that side thy Mill-dam, then thou must make some course, or plant some trough under thy Mill-dam, and so carry it under into some lower course that may preserve it from soaking thy meadows, or pastures under it, and by this meanes thou maiest in a good measure reduce thy Land to good soundness, and probably wholly cure it, and preserve thy Mill also. As for that objection of hindering the grinding of corn, it is very frivolous, for

First, there are in many parts so many Mills, as hinder one another, and are scarce able to live one by another.

2. There are, or may be Wind-mills erected in most parts, that may supply that want, and are less chargable than Water-mills: And for that some say the wind is uncertain, I say it is so certain, that I am confident few or none need want grinding if they can get corn; for I my self live in a Country where are no other but Wind-mills, and have scarce in a twelvemonth known any want of grinding. But should it be so, one may be supplied by Horse-mills; one good horse will grind wheat easily, and two good horses will grind any good dry corn, and are not at that charge for repair, as both Wind-mills and Water-mills are.

3. I say it is possible to devise a Mill, with truth of workmanship, and some other advantages, that two men may grind any good corn whatsoever, and that as much in an hour as any usuall Water-mill in the Country; and to this work I shall commend one Mr. Dimock, a very ingenious Gentleman, and one who hath discovered so much to the World already, as may give sufficient testimony of the truth of his abilities in this kind.

CHAP. IX.

*The Ninth Chapter shall be a brief and plain
discoverie of the most Feacible way of
Fen-draining, or regaining drowned
Lands, or in bounding of the
Sea from it.*



AS to the Draining or laying dry the Fenns, those profitable works, the Common-wealths glory, let not Curs Snarl, nor dogs bark there at, the unparralleld advantages of the World; give me leave, because hitherto all men have Monopolised their inventions as they call them, as possibly they might lawfully unto themselves, and the mystery, and no mans Experiences therein have at all been published to publique view, which whether it do arise from a privacy of Spirit, self advancement, or rather from an ungratefull frame of men, Governors trusted with the publique Weal of a Nation, or great men well able to recompence publique discoverie, whose shares will be greatest of the Advantage (which last through Charity I am bound, and from sad Experiences many Ingenious hearts have found, I doe beleve) but no man as I ever yet saw or heard, hath published any thing at all to any such purpose as to dismystery the same, therefore by the good leave of thy patience I shall take boldness to pull off the vizard of those apprehensions I have found therein, and discover the open face of that Experience I have made, be it beautifull or deformed, in pittie to move others to cover the deformities thereof, or put more beauty thereon.

In the discourse whereof I shall candidly endeavour to draw it into as plain a Map or Platform,

as the roughness and confusèdness of the work, or my weakneses will admit; and to that end shall confine my self to these particulars.

1. What drayning is, and a discovery of Fen-Lands how they lie to those that know them not.

2. To discover some of the Rubbs or hinderances that lie in the way of working it to the Common-Wealths advantage.

3. To hold out the Cure, or best and speediest way for the Reducement or recovery thereof to perfect soundness.

4. To discover the best and most profitable way of improvement of those recovered Lands to the best advantage of the Common-Wealth.

In all which I shall say but little, nor can say half that is to be said herein, but to each shall speak somewhat as near to truth as may be, and leave the Complement to succeeders.

1. What Fen-draining or the recovering of Lands from under water is, that deserves the name or merits the Title of perfect Draining.

What Fen-Draining is not.

I say it is not only the overly taking away the Water from off the Surface or over part of the Turf or Sword, for then might all bogs or quagmires be recovered, and easily would; Nor the taking off the downfalls, as our Fen men call them, that is, the waters falling from the Heavens in great Raines and showers; Nor is it the taking off all Land-falk, Land-floods, or great waters from off those Lands; No nor the doing of all these in a customary and usuall way that doth or will deserve to be called a perfect Draining.

What perfect Draining is indeed.

But it is as I formerly said about recovering Boggy-Lands, a going to the bottom of the Corruption, and taking away the Venom that feeds the Fen or Moor, that wateriness and coldness

coldness which gnaws out the spirit at the root.

And the taking away this is perfect Drayning; for although I say the other Draynings are not the best nor perfect, yet I neither discommend the other, nor discourage from them where they are made already, or may be made hereafter, but highly commend them or any of them where otherwise there would be none, or the Lands lye wholly drowned; yet being in all Arts, Trades, and Callings, we ought to study out the Mysteries thereof, and all men do or ought to endeavour to raise the richest fruits, and draw forth the greatest plenty to the Common-Wealth they can, out of the whole Earth; so out of this small parcell we never accomplish *The End* untill we have brought it to it's best perfection, that is; not onely to recover it from drowning to bearing sedge or reedy staggie grass, which is the first fruits of Draining, and from which the rude ignorant Fen-man desires no appeal, nor is it to recover it to bear morish foul strong grass in Summer, and Drowned in Winter, nor yet to lye dry both Winter and Summer, upon the Surface of the Earth, and wet and Boggy at the spades or Plough-share point; nay though it will through a dry season or heat of Summer bear the Plough, and much of it may be converted to Tillage or Corning, but still unsound in the bottom, all this makes not (though a good) yet not perfect work, but the perfection is in the reducing it to soundness and perfectness of Mould and Earth, whether Sand, Clay, Gravell, or mixed, then returns it to a perfect Soard and pure Turf, brings forth the small common Thistle, Clover, Crowflower, and Hony-suckle, then shall you reap the Quintessence of the Earth, in breeding, feeding, or Corning. These Lands thus perfectly Drayned, will return to be the richest of all your Lands, and the better Drayned the better Land. Where are your richest Lands of *England*, but your River Lands, your Marsh Lands, that all of them lye under the Levell of the Sea, and were it not inbounded by the banks, and the power of Gods word, would all return to the Sea again, but through their perfect Drayning, are most excellent sound and warm Lands, yea some of them so good, that usually the Winters profit of

How to know
when Land
is firmly
Drayned.

their Grazing equallizeth the Summer, as witnesseth much of the Marsh-Land near *London, Blackwall, &c.* with many other parts? Whence is the richness of your English Holland Land but from the pure and perfect Drayning? And the out-landish Holland Lands recovered to this great height of Richness? I know all Lands are not so Fecible as others are, nor some cannot possibly be brought to that perfection as others may, I shall provoke unto the best Improvement, and where there can be a Male-Improvement offer not to the Common-Wealth a Female, and so you have as plain a description what Drayning is as I can give you: I am of a strong opinion that there is very much Fen-Land may be recovered to as great a worth and goodness in it self as any Meadow Marsh-Land in *England*, which leads me to the second branch of this particular, to describe the Manner and lying of the Fens, to the which I am induced too for these Reasons.

1. Because many know them not at all.

2. Because many are discouraged from the thoughts of attempting the Improvement of them, that are very able thereunto, & I am confident would have recovered them, yet partly because of their ignorance of the lying of them, conceiving them to be some great Lake, Pan, or Meer, as are some in *Lancashire, Cheshire, or Yorkshire*, that lyeth so low that hath no fall or out-let can be made to drain out the Waters of them, and partly through the scandal and offence that is taken and given out, by rude, customary, and most an end unrightfull Commoners, against the Drayning of them; as also conceiving them to be nothing els but some great Bog or Quagmire lying so flat as is not Draynable.

3. Because my self was once before I knew them in some measure thus deceived, but especially because the report of the Country people was as one man, that the undertakers Drayning had no whit at all advantaged them, but that their Fen Lawes and Commission of sewers, and the works they made through that authority, and by the directions and meanes they used, had brought the Fens into as good a posture as all he undertakers works, (the which my self was hardly drawn

drawn to believe) endeavouring hereby to suggest the impossibility of ever accomplishing a perfect Drayning, so that many not knowing that the fall is considerable in it self, and very great into the Sea by reason of the Ebbing of the Water, will thereby give opportunity unto a most compleat Drayning of them.

And lastly, that by this information I may quicken all Ingenuous Spirits to the helping on the work so advantageous to the Common good, and yet so fecible, I therefore describe the Fens of *England* to lie in some proportionable manner to those great Rivers and gallant Meadows adjoining to them in many ever, and less descending Countries, onely with these two observations.

1. That these Fens are nearer the Sea, the Center of the waters, and so we must conceive the fall or descent to be the lesser; for as our lesser Brooks run quicker than our great Streams, and the bigger the stream and nearer the Sea any great River runneth, the slower by far the water descendeth, and flatter the Land lyeth, so the Fens being a far vaster and greater compass lye more flatter, and the Rivers run the slower.

2. Because these Fen-Lands being far greater, and many times more broader than our greatest Meadows, therefore being covered with water, and lying more levell, will not Drain so fast, and so can not hold comparison in each particular, yet a more suitable Modell to describe them by, to those that know them not, I cannot Frame.

So that the Fen-Lands so called are as I may say, great Meadows covered over with water in the time of a great Land-flood; for as upon great rains the Rivers or Water-courses in the uplands are not able to contain the Floods, neither are the Fen Rivers Sewers or water-courses able to take away those Floods that come out of the higher Countries, or uplands aforesaid. And as the small brooks first overflow, because of the disproportion betwixt those narrow watercourses, and the floods that run in them, and are unflowed again, when or before the great Rivers begin to rise, and the Flood of the great Rivers continue longer than the lesser,

The just Form
or Modell of
the Fen-lands.

so the Fen Rivers or Water-courses being much lesser, proportionable to their great Floods than the little brooks are, they can not contain their own water Floods, with the Rivers and Floods of the upland Countries too; but are forced over the banks into that great Flat or Levell of Fen-land and Meadow on both sides their Water-courses, and being there dispersed many miles into a great breadth and length, & being ever and anon relieved with fresh Land-Floods, most part of Winter long continue, neither having a great fall nor large roomy Water-courses into the Sea, nor other artificiall Receptacles to receive them, cannot so truly nor suddenly run off again, but had they Water-courses proportionable either in Number or Greatness, to other great Meadows, they would most of them drain themselves, and return to as perfect Meadow and Pasture as any in England, for almost all Land-Floods and Rivers that lye on the same side of the Country the Fens lye on, from the highest part of the up-lands, run into and through the Fens to the Sea, as their constant course, & if the Spring be kindly and moderately dry, the Fen-water runneth and dryeth away apace, and many times in February or the entrance of March, especially when the winds fit fair, that is, to drive the waters Sea-ward, they are grazeable with great cattell, and many times with Sheep too, and some part of them are all Winter dry and never drowned, and many of those keep as much stock of cattell, especially of sheep, all Winter, as ever I saw any Common or pasture without hay. And to conclude this description whereby you may not onely frame out a Model of the Fens, but discover the Feasibility, if not the only way of Drayning them, which ushereth in my second particular, which is,

2. The discovery of some of those hindrances or rubs that either hinder or facilitate this work of Fen-draining, and they

they are either in the Land it self, the
Commoners, or the undertakers there
of.

The first Hindrance is in the Land.

1. In the Land, there may be such Mountaines and Rockms betwixt the place you desire to drain, and the Sea, or River into which you must draw your drain, that it may make the work so chargeable, as the profits thereof will not counterpoise.

2. Also there may be such a Vein of Earth, as is so Moorish, or exceeding Sandy, upon which you must be forced to plant your Sluces, or Water-gates, as besides the extraordinary charge of Workmanship, may much hazard the continuance of the Work, and so with extraordinary charge, and great hazard, may render the fruits thereof below the expences. These things are possible, yet not usual.

The Second Hindrance may be in the Peoples. The Commoners, and they may, and do much hinder it in reproaching of the Work it self, as I hinted before, and weary the minds, and weaken the hands of others that would endeavour it. But the greatest hindrance is their unfaithfulness to the Work, by their dulness and neglect of raising sufficient summes of monys to carry on the work, and raising it so seasonably, as may expedite the same, for these Works are not to be trifled withall, it must be the speedy and powerfull carrying on at once, as well as the Artificiall and wise managing of it. A little season lost, may lose the cost and works of a whole Summer, and whilest neighbors are contesting about the quality of their Levies, and disputing every mans Right to pay, and gathering up their moneys, the Works may run further backward in a week, than they were brought forward in a month. I have seldome known a rude multitude, or a confused heady people ever agree in this; these works creep forward, but run

How the Commoner is a hindrance to Fen-draining.

post backward. Again, the combination of labourers and Poor people may very much prejudice, besides their slothful and senny slubbering off it, if not exceeding carefully overseen.

How Undertakers may be prejudice to the work.

The Third Hindrance may be in the Undertaker, or Drayner. And although this may not be such an Essential Prejudice to the Work it self as the rest are, because a man would think that he that either for his wages or credit works it, should doe his best; yet to the common good it may be as destructive as the former: And herein, and in the former Hindrance, as I desire not to discourage any Ingenious Spirits; so neither do I desire to fawn upon the most ablest Artift, but do hereby affirm, that the Undertaker, or Artift in this Work, may exceedingly Eclipse the Common Good, and through a corrupt selfish Spirit may monopolize to his private advantage particular mens Interest, and in and under pretence of doing a Common Good, may utterly ruin thousand soules. Corrupt self, or Corruption it self will endeavour this; but an Ingenious Spirit scorns perfidiousness; yet many an Undertaker may in these respects be an hindrance to the prosperity of Fen-draining, if he be upon a publick Work, for private I meddle not withall.

1. If that he lay not out a good Foundation, he either wholly spoils it, or at least bungles out a half work, and leaves the Cream behind him, and it destroyes it self at last.

2. If that men shall pick and cull their Lands, drayn those that are more fecible, and leave out those that are more difficult, I say he is an enemy to the Common good; And this is a Maxim I shall declare, Drain the worst, and the best will drain it self; and sometimes the lowest Lands may, if thoroughly drained, prove the best Lands, and be the speediest and easiest way to drain the whole.

3. If that men drain those Lands wherein they are like to have an interest, throughly, and those the Commoners have, more overly; or imbank, or secure the one from land-floods, and not the other; or if he make not such a thorough drain,

drain of all as may go to the bottom, and lay it sound at root, I am sure he will not attain the End, the best fruit and advantage the Lands will yield; which that it may be accomplished, I shall descend to the third Particular.

*The Third Particular to be considered, is,
The Cure, or best and speediest way of
Reducing drowned Lands unto perfect
soundness: A Work too great for my
shallow parts, and scanty leasure.*

And therein because I shall not dare to teach men so many degrees abler than my self, I shall onely modestly propose some few *Queries*, the which if any shall answer in lines or practice, I shall have my End, the Common-wealth will receive more light, and I my self full satisfaction.

1. Whether all waters whatsoever, the more they increase in quantity, the more in weight? if so, then *Queries in
Fen-draining:*

2. Whether if all waters biggen the further they run, especially in floods, whether then all water-works or cuts must not biggen and strengthen also, if that a perfect securing from Floods be intended? And if so, then

3. Whether all Water-courses that are made for drains must not widen, biggen, and strengthen proportionable both to the Land-floods that come out of the upper Countries, as also proportionable to the waters, or downfalls that come from Heaven, and fall upon the said Lands? And so require answerable Receptacles? if so, then

4. Whether, or what is the proportion, or how may a man know the gage thereof, and so how to make every course equal to the water it must carry?

5. Where the greatest difficulty lies in drayning the Fens, whether in drayning the Fens from their own naturall waters and moisture, or in preserving them from the Land-floods that come from the high Lands? If the great difficulty be to preserve them from the Land-floods

Reasons why
the land floods
would be best
taken off on
the outside
the Fen.

Of other lands, as to me seems probable; then whether it would not be more really advantageous to a perfect draining to take off the Land-floods at or before their entrance into the Fens, and so carry them along the Fen-side, under the up-lands, and not suffer them to come into the middle of the Fen, as long as it may be kept off, untill you come to strike with one straight course into the out-let of the Sea or River, or within some few miles thereof? And whether this would not be the likeliest certain means to prevent the just offence the Commoner and Country seemed to take in the last undertaking, who *una voce* cry out that the Undertakers secured their own by banks, and preserved them from the Land-floods; and drowned all the Commoners side as much as ever, and that by every considerable Flood? And if this be granted, then I dare conclude the Fen will drain it self with a small course, and with greater speed, and more certainty, as well as more substantially: And so I shall onely move this further, and so refrain.

6. Whether if any of the aforesaid particulars be affirmed, then must not of necessity all the Out-lets or Mouths of all the Master-work, and Sluces, and Water-gates, be widened and made proportionable to your higher courses, lest that the water receive a check thereby, either to force your Sluces or give a recoil to the waters into the Fen again, I mean proportionable as well in greatness of the fall, as to the breadth and depth of the water-course.

I shall onely now desire to know whether when the Master-drains are made substantially deep, it will not be to most advantage to divide the lands into lesser divisions by small draines, than to cast them out into greater proportions? yet I shall not prescribe so small as some do, but into the most convenientest divisions may be for the compleat draining.

And as to Sluces, Water-gates, Locks, &c. I shall say little, because they are under the command of Rule, and Truth of Workmanship; and a good experienced Millwright or Engineer is well able to regulate them to as much Advantage for close shutting, and suitable opening, to the incomming

comming of the Tide, or out-going of the Floods, as the variousness of opportunities will require, which I forbear, because they cannot easily be described without figures.

And as to the severall Tooles to be used in the working of these Water-courses, they are common, and most of them in common use upon the Fens, except a good water-levell, which I have at large described in the tenth Chapter, which is most essentially necessary for the casting or laying out of all the Works therof, and a Trenching Plough to cut out the first Works, and the Turfing Spade, all largely described in the next Chapter.

I shall onely speak a word or two to the Improvement of some particular parcels of Fen-lands which in themselves are drainable, and without the least dependance upon the general draining, although I will not say but such Land would more easily be drained in the generall, than it will be done of it self; yet seriously pondering all things in one even balance, there may be little difference, and that upon this account; if it be done as a member of the General, then it must contribute to the generall charge, and share in the generall breaches or miscarriage, and in all particulars stand and fall therewith; Also then it is subject to the same hazard, as the generall is, of prejudice, by reason of the differences that may arise betwixt the Owners, Proprietors, Commoners, Undertakers, or whosoever, which may be very many, and so great, as may tend to the ruin of the whole, which without dependance thereupon it will not be. And I am confident, some very considerable parcels of Lands lie so convenient, and so fecible unto the Work, that they may be done most easily; and others I ye more difficultly, and will be done more chargeably; All which I shall hold forth under these two descriptions.

Some particular Lands may be drayned of themselves though the generall be not.

1. Are all Lands that lye somewhat higher of themselves, and are never drowned (unless it be by some extraordinary Inundation) of themselves, these are most easily recovered of themselves, at a little more charge than any common Lands are inclosed, and that by one good substantiall Dike, well turfed (or sodded, as the Fen-men call it) on the outside

All such Lands are most fecible to be drayned.

round about the same, and well rammed and beaten together, it need neither be very broad nor high, the height and weight of the water offending will discover that unto you, nor indeed cost any more than the charge of a good quick Dike, which every good Husband bestowes upon a new division; and I dare say there are many thousands of Acres of Lands in many parts of the Fens of this nature.

2. The Second is the more difficult, and yet very feasible also, and that is certain Creeks or corners of Land running into the up-lands, and upon the out-skirts of the Fens, and many out-borders that are onely annoyed with their own, and the swelling of the naturall Fen-waters, and are clear from any Land-floods, or up-land waters running through them, and have one or two sides firm, and the securing of one or two sides more will secure the whole. These are easily drainable without dependance upon the draining of the whole Fen, and that by a more substantiall Imbanking than the former, to secure it self from the great waters of all other Fens, and then there will onely rest to resolve how to drain it self; to which I shall onely say, that having well provided against the waters of bordering Fens, find out the lowest part of all thy Lands, and thither draw a good substantiall Master-drain through all thy Lands, and there plant a water-Engine, which may either be wrought by the wind, or by the strength of horse, yea possibly by the strength of two or three men; which if the compass of thy Land be not great, and thy water small, may be but a very inconsiderable charge. And thy Engines may also be divers; as an Engine or Windmill may with a water-wheel, planted in thy Water-course, or Master-drain, or very near unto it, which water-wheel must be made to that height as may be sure to take out the bottom of the water, and deliver it at the middle of the wheel, which wheel may be contrived into such a form, as that the Laddes, as I may call them, or Peals, or Scoops, as others call them, will cast up, and cast out the water to a considerable height, as a man doth with a hand-scoop, pail, or kit cast water out of a ditch, which Engine shall at large here-

after

Water-Engine
helpfull in
draining.

Chap. 9. *Reduement of Land to pristine Fertility*

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after both be described, and the form of it delineated, or else by a good chain-pump, or bucket-work, both which may be made into a Wind-mil-Engine, or else with an Engine made with a perpetual Screw; all which for that height as is requirable to the draining of such a Work, will lay a good compass of Land dry in a few daies, and iftime prevent not, shall most of them be described at large.

3. But a Third is most difficult, which I yet conceive also fecible, and may be recovered also to a great advantage: And that is such a parcel of Land that lieth also at a skirt, or out-side of the Fen, although it may have some Land-flood running through it, or near it; which Land-flood, if it be possible either to divert it on the one hand or the other, of the Land you desire to drain, or else if it be a small Flood, within the compass and power of an Engine, may also be drainable, and by the aforesaid direction of inbanking the Land, to secure the Land-floods from coming on at at all, which with a reasonable Bank, and a fair open passage to convey the Land-floods cleyly away, may prevent the fear thereof; And then a fair Master-drain down through the lowest ground, or neer the middle of the Fen you desire to drain, which must be made so deep, as that it may substantially draw all cold corrupt water into it self: I prescribe no depth, because I cannot give to all sorts of Fen-lands (no nor to any other by measure) a suitable and necessary proportion so far from off the place where it is to be made, and this drain to be continued to that place where you have most convenience to land your water, and there planting one of the aforesaid Engines, I shall leave every of them to each mans own affection. I know they will every one do the Work, and that a very considerable charge, to the profit and advantages to be received and reaped hereby. I shall say no more in this case, because I much more desire the general Work, which will make all these particulars to come on the easier, The draining of the whole Fens, yet considering the rubs that lie in the way of the general, and the great delays and uncertainties thereof, I am perswaded to discover the capacities of particulars.

These more difficult, and yet fecible.

As for the particular Engines, the Figures and Delineations of them, they shall hereafter follow, to be described to the very capacity of the Country Farmer, as far as possibly may be: And because I desire to speak to the understanding of the meanest, you must a little bear with my tediousness, till you come to the practice, and then you'll find plainness very usefull, and all I have said, little enough to discover the same.

Now to proceed to the Fourth generall Head of this discourse, to set forth the best way of Improvement of the aforesaid Lands.

I shall say the less, because through my whole discourse it is my main Scope, and so shall confine my self onely to some of those particulars more peculiar to these Lands, though being substantially drained, they are capable of the impress of any Husbandry whatsoever; I shall therefore divide the Fen-lands into three sorts. First, The sound dry Land, seldom, or never drowned. The Second shall be your constant drowned Lands in times of great Floods. And the Third shall be your lowest Land of all, that lieth constantly so wet and cold, that it is turned into a very Moor or Bog.

1. Your dry Lands, I for the present account them the very best, and most capable of raising the greatest present profit, I shall therefore (because it is fruitfull of it self to grass, and will yeeld advance enough thereby, and also because there will be enough for many years of the other two sorts remain to husbandrize, and rots and tumble up and down) perswade to lay it all for pasturage, until your other Lands be perfectly recovered and improved; but this may prove undoubtedly excellent Hemp-land, Oad-land, & may be, Mather-land, and most excellent, yea rather too good for Cole and Rape-seed, because there will be other works, enough for that.

To.

2. To the second sort, only drowned by up-land floods, & so lie dry when the flood is gone, I say, if this be not leavened with coldness, or steeped so with constant corrupt water, that it is turned into a moorishness, but yet remains perfect Land, and clear Soard, this very Land may prove your best Land in a little time, and therefore I shall onely for the reducing hereof, advise to a moderate plowing of it; and for the reducing of it to perfect soundness, advise to raise it every plowing, dividing each ground into lands about three yards over, or thereabout, which will take two casts of seed, and in five or six tilths will rise up to so convenient a height, as will lay it sound and dry, and increase your Land also; yet however you must not endeavour the laying any Land any higher than your drains will be sure to draw your furrows: But in case the Level of your water will not admit you to raise up your Lands to so good a height, then you were best make your Lands somewhat lesser, and then the fewer plowings will lay them round and sound: but be carefull not to make your last furrow alwaies in one place, but in each plowing shift one furrow, or more, sometimes one way, and sometimes another, and this will preserve the furrow from overmuch barrenness.

This Land may be suitable and very excellent for Coseed, and coming to its perfect soundness for most of the aforesaid opportunities, but exceeding rich for all sorts of Grain, out of question, onely I shall earnestly perswade not to plow too oft, nor impoverish it too much at first, for hereby most men undo their Lands. I conceive it best not to plow any of these Lands no longer than it is brought into a perfect Tilth, or one year after, three years may do best; though four years may do well, and you will find a galling sweet Turf succeed, and soard thick suddenly and sweetly, and your succeeding profits, all things considered, may reach your very benefit of coming to a very neer scantling. I have heard very many object that matchless prejudice by so tedious and thin Soarding, and have affirmed they have tried it by experience, and find plowing woefully destructive; And if you should demand how many years they plowed it, they must needs answer, some 5, some

6, some 7, some 8, and some 10, and others more; and if you again ask them how they laid it down, they must say for the general, they cast them down, and left an open Ridge to graze; and if you should again demand upon what stubbles or sadish did you lay down your Land for graze, some say upon the Peas stubble, or Barley, and here & there one upon the Oats, which is better than either of the former, but none say upon Wheat or Rie, which I as highly commend, and for the first yeares Soarding goes beyond them all, they neither bestowed any soil upon it first, nor so much as a few hay-feeds at laying down, and yet they will tell you a story of I know not what experiences they have made, when alas they never knew that an Experiment must hold in all its parts, and relate to times, seasons, natures, as well as fruit and crop, and so bring an ill report upon the best husbandry, and stifle their own greatest gain. But of this no more, because in other parts of the Book it is more largely discussed; yet bear with me if repeated, because this is the discovery of the husbanding of a new World, as a man may call it.

A new World
may best ad-
mit of new
Husbandry

I proceed to the Third sort, which is your lowest land of all, and lieth deep and long drowned, that it is even turned to very Turf or Bog, and very little useful, onely two or three months in summer it is commonable; but whether profitable or no, I scarce know, nor (being a stranger both in those parts, & to those Lands) will I be peremptorily confident in any thing, as will not hold proportion and use with other Lands; I shall therefore only question whether in commencing upon these Lands they do not oft stifle their cattell in the morishest places; & whether they rot them not, or choke them not, through many incurable diseases by reason of the unwholsonness of their pasturage. This I dare affirm, I have seen many poor thin cattel, which have brought *Pharaohs* lean ill favoured kine into my mind, and such truly as I have not so familiarly seen upon healthy barren Commons, ten Acres whereof is not worth one of these; and yet thousands are prejudiced against the draining of them; but to the Land it self, being recovered and laid dry, it will require more time to recover it self than the other better Lands, & require

require more cost and husbandry to bring it to Fertility, and though all the preceding directions are, on may be applyable here unto it in their proper Seasons, yet some other work may be more naturall as a ground-work to other Husbandry, and that chiefly upon your hallocky moorish rough Land, the which being left to grass, I cannot conceive it worth in its present state not above 3 or 4^s per Acre, and some under, and yet that very same Land, by paines and patience may recover to be very good Land immediately. I shall therefore advise that this Land be turved, or as some call it, denshired, that is, all the hallocks cut up, and the over-turf parted up, and all laid upon little heape till thoroughly dry, and then burned to ashes, and if it be all stringy, rooty, and very combustible matter, then the thicker you pare it up the better; for although I differ from many of the West-Country Husbando about this denshiring: their thin turved Lands, that are pure from roots, twich, or moss, conceiving (that though it bring their Land into sudden Tillage, and to yeeld out it's Spirit the first year) it weakens the Land much, there being no addition to it but a few bushels of ashes to an Acre, in stead of good Turf or Soard, that in a Summers working will be easily brought to Tillage, and (as I believe) ads more by far to the fattening of the Land than those ashes do; and I am sure, when any one layeth down his lands to grass upon this Husbandry, the Soard comes pale and wan, and very lean and low, and never riseth to a good Crop, and whosoever seriously observes the same, shal find that very issue; yet to Lands of this nature I as highly extoll it, and to all such foul Lands, where is depth of soil enough, and all so combustible as nothing else will work it unto Tillage. In the midst of May, or any time in the very beginning of Summer, when the Land is thorough dry, is best, and the earliest also, that you may have as much of the Summer as you can, to the working of your other Tillages, which being burned in a dry season, proceed to plowing and ridging up your Lands, and dividing them into such proportions as your drains will bear, as is directed in the aforesaid last particular, & this will then be fit to take the impress of any seed; much of this will bear Cole-seed, or any grain, which I leave to the

Denshiring
Even lands very
usefull.

Denshiring
lands reproved
in the West.

Burning Land
extolled in the
North.

dis-

discretion of the Country Experiences, onely pray you study laying all sound and warm; plow not too long, and lay it down to grais either upon the Oat-stubble, which will soard exceding well the second year, if not the first, or upon wheat or Rie, the Land harrowed and laid very smooth; this will soard excedingly the first year, as in other places of the Book I have at large discoursed. And as your Land recovers soundness, you will by your improving your own experiences, have more Talents added to these, you have more opportunities to raise new advantages out of them.

Lands drown-
ed by the Sea

Now to the conclusion of this Chapter, I shall onely add a word or two of Sea-drowned Lands, and it shall be very little, because as to the improvements of them whatever hath been before spoken and applied to other Lands, may be to these, which being once recovered, are very sound dry Land many of them, and the rest may be reduced thereunto by good divisions and drains, as in all other Marsh-Lands.

All the mystery of this is in the recovery of them, which to discourse at large, would be more tedious than profitable, because as to the materials for imbanking or bounding the Sea, whether Stone, Chalk, Wood, or Earth, little can be said, because all must be referred to the conveniency and necessity of the place upon which they are requirable, onely there must be great regard had to the force of the Sea that lies upon them, and the strength and violence of the winds to which it lyeth most obnoxious; for I am perswaded it is not so oft the Sea it self that makes the breach, as the strength of the winds that forceth it over the banks; neither can I prescribe the severall Locks or Water-gates necessary for letting out the Heavens water, nor the bigness or strength of them, that being proper to the place upon which they are to be erected, there to be discoursed and described, and the common Engineers are very customarily used thereto; As to some good ingenious painfull Artist, little can be added, so that there remains only that I advise to these two or three general directions.

First, That you be very carefully observant of the power and way of the Seas working; for although it is possible much
Lands

Lands may be gained from the Sea, yet it is not possible at all times to keep the same when it is gained; therefore where-ever you see the Sea get or recover upon any Land, be wary there, rather study to stop the Sea there on the borders, and to divert the force of it another way, which will sometime more easily receive a check than at other times and places; but if that be not stayable, I should advise not to be too busy there, but where the Sea loseth, and Land increaseth, there is a more probable opportunity, and there I should rather pitch down my staff. There is store of these Lands to be recovered, so that I would not perswade any to streighten themselves with hazards and inconveniences, when there is such a wide opportunity for the ingenious to improve both parts and purges on the borders of these Nations.

Secondly, Be very carefull of placing your out-falls and water-gates in so convenient parts as may both be best for the firm draining of your Land, and for the firm founding of your Sluces and Water-gates, both in relation to the Earth you plant them on, and the force or strength of the water that lieth against them; or accidentally through some fierce storm that may come upon them; this hath been the overthrow of some gallant works, and particular rules here cannot be discouried but through so much tediousness as will tire thy patience, which I must forbear.

Thirdly, Be above measure studious about thy Imbankments, that a foundation be so firmly laid to the bottom with such materialls as will hold out the triall; therefore in every new work some triall would be made of all materials, and therein thou must be steered by those the very place affords, whether Stone, Chalk, Wood, or Earth, or all, and the present experience upon the place will be a better Tutor than I can possibly, for I much question whether the carriage of any of these far, will answer the cost or hazards run therein. Be sure your foundation be broad, well ramm'd together, and so raised with solid matter and workmanship a good height above the highest Tides, and curiously turved or sodded on the Sea-side; the better is your Turf the firmer is your work; for if that it once begin to hole, or break, look to the main, it is in danger, and ever be sure your new works be made the

highest, because an overflowing upon an old work is not so dangerous as upon the new, that it quickly and easily overthrows.

Lastly, Be sure of ingenious and laborious workmen; an idle slubberer will both deceive the work and Master, study not so much cheap wages, as to have your work well done for good wages; careful ingenious Overseers of the Labourers is an unvalued furtherance to the work, some men have an excellent *Genius* that way, will awe men more with their wise industrious oversight, and skill in mens frame of Spirits, and wise designing each man to his place and work, that all of them shall be as members of the body, co-adjutors to the whole, one take it from another, so as no work be done twice over, nor one mans labour bear out another mans sloth, but each be helpfull to another, so as to advance the main. I tell you this is a mystery, and a man rightly qualified for this work is worth gold, and very rarely to be found. I have seen some Bayliffs intrusted herein, stand telling a story, while all his workmen have stood looking him in the face, admiring him for his Rhetorick, and this hath pleased him as well as their working; many have an easie way of hindering work, but few of furthering it, and he is a rare man that can sort all his works so into each workmans hand, as that it goes on to purpose; confusion is through ignorance and sloth; a good method, or plat-form to advance each mans labour to the best furtherance of a work, is difficult, requires great ingenuity, and laborious study, I find it most difficult, though I have had as large experience of it as most Englishmen, yet cannot accomplish it, but many times ran into confusion, through mens rudeness, and my want of each particular experience in each work, the which I instance as a Rock for others, to beware, and prize and value a good Overseer, whose countenance and conversation is such with workmen, as will not onely awe and force them, but his wise and loving demeanor will compel them to their utmost faithfulness; a work in its geares will thrive exceedingly. And so I have done at present with this particular, till I have gained some more, and new experiences; and with this Chapter.

A Good Overseer worth Gold.

CHAP. X.

*The Tenth Chapter giveth directions to make
and use certain Toolles, or Instruments,
which shall much facilitate
the Work.*



And for thy further Incouragement, because Drayning and Trenching is found very chargeable, therefore in the third place I will discover certain Toolles or Instruments, which shall make the work more facile and delightfull, with which two workmen (and indeed any Ingenious man many quickly attain a handiness, and dexterity therein) that can well handle them, And shall doe more than many common Labourers doe in one day with their ordinary Toolles, and shall work more true, and more suitable and commendable to the nature of this way of Improvement, which Toolles are all very plain, and simple, without severall motions, or divisions, made onely for ease, lightness, and quickness, not for Admiracion or Confusion.

Toolles belonging to Draying and Trenching, to make the work more easie and less chargeable.

The first is a good Line about thirty two yards long, made of the best Water-wrought Hemp, and as big again as Whipcords, upon a good Reel to wind it upon; I prescribe this length because of drawing all Workes as near unto a straight Line as possible may be; which length is of use in measuring your Work by the Peatch or Rod as you desire also, and no more of this.

A good Line.

The second is a Water Levell about five foot long; the longer the better, but that it will be the far more unportable, but four foot & an half will do reasonable well; with Instrument many have assayed and made, some open with a Channel for the water to run all along upon a three inched Piece of Oak, with sights placed at each end, true to the

A Water-Levell.

water,

water, that is each sight of a just proportion from the waters to direct the Levell, but this lyeth so open to the Wind, and is troublesome removing, that it is not worth prescribing.

*Sir Edward
Peto his Level.*

*The manner
and form of a
true, and the
speediest Level
that I can de-
vise.*

Others have used them of seven or eight foot long, to be placed on two or three legs, as the Surveyor placeth the plain Table, the Levell made with an hollow Concave, for the water to lye hid from the Wind, and to come up in two Cups (above the wood) planted in the Levell, and sights planted very Artificially thereto, the water in each Cup holding his just proportion to both sights, and this is a very good one, but very troublesome to remove up and down, and to make dispatch when one hath need; And in this second form were Sir Edward Peto his Levells made very costly, and the Sights of good value, whose Ingenuity was very great, and the Instrument very good and rich, but a little troublesome to carry up and down; but I rather chuse a plainer Piece which is very Portable, and it is made to fold into another square Staff, and so to carry like an Hunting-Pole, my Staff is but five foot and an half long, made of the best young seasoned Oak that can be got; my Levell, or the Barrell of it, is but four foot and an half, or five foot long, which Barrell in the midst of it, is planted into the top of my Staff thus; Just upon the midst of my Barrell is a pair of Iron joynts curiously wrought into the very middest of my Barrell, on the neather side of it, and at the very over-end of my Staff, and so much of the one part of my Staff, and just half the length of my Barrell taken away with a moulding or rabating plain, untill both joynted together with these joynts make one compleat Staff straight and formable, onely about a quarter of an Inch taper upward, from the bottom to the top; that it may not be too top-heavy, and the Sights are to be fixed unto both ends of the Levell Barrell, that they stand firm and hold water, and yet are very little or no annoyance, either to Sight or Practise; And in the portage of it, it is a faire straight Staff, with a strong Pike in the bottom of the Staff, and a step to set the foot, or force it into the ground where there is no occasion to use it;

it; And in the Exercise of it, being unfolded it is an headless Cross, not much unlike the Surveyers cross Staff, which when thou hast done thy work thou mayst fold it up again, and walk as with an Hunting-Pole. Any good Gunsmith will make the Iron-work, and some Gun-smiths will make the Wooden-work also with direction, but properly it belongeth to the Joyner.

Who are the makers of it.

The next is the Trenching-Plough, or Coulter, whose speciall use is to cut out the Trench on both sides with great expedition, which is thus made; Take a Piece of the best tough Willow, about the bigness of a Spade-stayl, somewhat strait, onely at the neather end it must look upward with a neck like a foot which must run upon the ground, and just above the neck must be an Iron, or little Coulter about the strength of a Butchers Knife, planted in the Stayl, where the Stayl must be plated with Iron, curiously let into the Wood on both sides, through which, as also the Wood, the range of the Coulter must come, with a Cotter-hole in it above, to cotter it close to the over-side of the Staff, or rather have two Coulters, one about an Inch and half longer and stronger than the other, that so in soft deep ground thou mayst use the longest, and in dry ground the shortest.

The Trenching Plough.

Whose use is, when that thou hast cast out thy Trench, and set thy Line, thou mayst with this run along thy Line, and cut out one side of thy Trench, almost as fast as a man can fallow it, and then set out thy other side, and cut it out also; but if thou studiest more exactness, then in the foot of thy Staff, and in the middle of thy foot, plant a little Brazen Wheel about four Inches high, that so the foot may bear it self a little upon the Wheel, which will occasion it to run more pleasantly; but the Wheel must also be curiously planted into the foot with Plates, and upon an Iron Axletree, wherewith thou mayst cut out a Peach whilst some will be cutting out two yards, and more true and certain; and so also mayst thou use it speedily to cut out thy Turf overthwart thy Trench, about eighteen inches, or twenty inches abroad, a fit proportion to be taken up, or

Sometimes two foot broad; for if thou wouldst take up all thy Turf as curiously cut square, and pared up about three or four Inches thick all of one thickness, just at the root of the grass, as aforesaid, of which thou maiest make exceeding great use, which thou must preserve most choicely, for therewith thou mayest cover thy bare places of Earth, or any low places that thou wouldst raise up to a Levell, and mayst have as good Grass upon it within half a year, better than upon the other Lands; For the taking up of which Turf thou must make a Spade on purpose, with a bit looking up twice so much as our ordinary Spades do, with a curious thin shoo looking up also; whose bit must be exceeding well steeled, and more broader at the point, or neather end of the bit, than at the over end, of about half an inch, and not above by no means; which will take up the Turf, all at one thickness, just at the naturall height a man useth it, as he stands to shovell Earth before him. This Spade is admirable usefull to cleanse the Bottom of Trenches, for which use it were very necessary to have another an inch and half narrower than the former, for lesser and narrower Trenches; which Spades (the broadest sort of them) are more speedy, and more easie for Banking and Levelling high places and great Ant-hills, by far, than other Common Spades are.

Turving
Spade.

The Trench-
ing Spade.

The next Tool that is to be shadowed to thee is the Trenching Spade, which you may make betwixt Four and Five Inches broad, and if you make Two, which is better, One may be Four Inches, and the other may be Six Inches wide, whose Tree must be made more compass and looking up, by far, than your usuall Spades are, yea somewhat more compass than your Turving Spade is, though but a very little, so that it may carry a Trench Levell before you, being forced by your strength of Arm, guided from about the bottom of your Belly, as you use the Shovell in any thing you cleanse; which Spade shoo must be made with two sides, or Langers, up from the end of the bit, like as if you would plant two broad Knife Blades to look upwards with their points upon a common Spade, from
the

The Trenching gouge
to be vſed as the
Spade



The Turving
Spade



pag: 69

The Trenching
Spade



The
paring
Spade



The Trenching
Wheele plough



pag: 67

The plaine Trenching
Plough



The Single
Wheele plough



The Trenching
Spade Cutting
it's trench &
the Water
Following



the end of your Spade bit, onely they must be made a little stronger, yet they need not be above two inches broad at the very bit, and as thin as the strength of the work will bear, little thicker than a strong Knife, and so Narrower and Narrower upwards, untill it come to halfe an inch, and about Five Inches long, which must be made very exact, and true, smooth and sharp, otherwise it it will not work forth his Coar, and Furrow clearly, and easily, but will be above a mans naturall strength; but if it be rightly made, any man may easily work forth a Trench at one time, and very fast, almost as fast as a man can thrust a Shovell under a little Sand or Dung before him. Some have assayed to make this Trenching Spade rudely and in other formes, which I will not stand here to disprove, because their own Experience hath laid down the use of them, but this I am certain of in my own knowledge is wonderfull usefull, and herewith one man may do more in such work as this (which to make greater Trenches is but to make more work to no purpose) and that more formally and Artificially, than six men can do with their own naturall and usuall Tooles, and they shall moyl and spoyle less ground by many degrees, which Tool so cutteth out his Furrow and Coar, that you may within a week or two, or when you have accomplished your desire, lay it down again, and no whit prejudice the least Grass, and none shall be the wiser for it, or Discover within two or three dayes whether such a thing was yea or no, and so will prevent the least spoyle.

The paring
Spade.

There is another Tool or two as usefull in these works, and no less necessary, and this is the Paring Spade, or dividing Iron, whose bit may be made all of Iron, being a strong Iron Plate with a good strong Socket, to put a straight tough Stale or Helve into, it must be made just straight every way, the Bit must be made twenty Inches long, the two sides and neather end all well steeled, the neather part of the bit a little bellied or square, and the sides a little hollow or compass d, and the end and sides as sharp as they can be made, for the especiall use of this is now and then to cut out a Trench

Chap. 10: Reducement of Land to pristine Fertility.

71

The use of the
Paring Spade

Trench in vallies, and low places, where thy Plough cannot come at it, but principally to pare old Trenches after the first year, whose Edges will grow so thick with Grass, that thou canst not get thy water to pass currently, and to dig it will break thy Trench, & cut it too thick, but with this thou mayst cut it as with a Cutting Knife all along thy Trench or Line, very fast and most compleat; Thy Stail need not be so long as a naturall Spade-stail, it must be kept clean and bright, and it will work exceeding easie; And thy ordinary Spades also the better they are and the sharper, and curiously kept, the better will they rid off work by far, and the more easie and delightfull to the Workman, and not fur and clog with Earth, which makes the work go off very heavily.

N

The

The Third Piece of Improvement shews how to Enclose without offence, and prevent Depopulation that is most common Attendant and Appurtenant to Enclosure, and how to make Severall all Arable Common Field Lands, and also all Common Heaths, Moores, Forrests, Wafts, to every particular Interests, and the Common-wealths great Advantage.

CHAP. XI.

The Eleventh Chapter Treateth of Improving Land by Pasture, Reproves Depopulation, proves excellent advantage by Enclosure, and taketh away the usuall Scandals layd upon it.



His Piece of Improvement will be the better carryed on, if we could but prevent two great Rocks men are apt to dash upon, and keep the Medium betwixt both.

1 Extreme.

The one is so Extreme for Pasturing and Grazing, as he will destroy Tillage, and raising of Corn,
so

so he may convert all to Sheep, Wooll, and Cattell; though the contrary be of incomparable more advantage, Credit, and Glory.

The other all for Tillage, and Plowing, that he will toyl all his dayes himself and Family for nothing, in and upon his common arable Field Land, up early and down late, drudge and moyl and wear out himself and Family; rather than he will cast how he may Improve his Lands by Impasturing, and Enclosing of it, whereby he may raise more profit in Sheep, Wools, Cattell, and far more Corn also if he please upon every Acre.

For the discovering a little these self deceivers to themselves,

I shall speak a word or two more large to each Extreme.

The first Extreme is partly through so deepe an Affection of Tillage and plowing in Common, although it be to his perpetuall slavery and drudgery all his dayes, he will not leave it, and especially through a prejudice he hath taken against Enclosure through some mens depopulation and oppression, and destruction of Tillage, that he will not approve hereof upon any Tearmes, but oppose with all the might and main he can; what saith he, Enclose, depopulate, destroy the poor? no, our fathers lived well upon their land without Enclosure, kept good hospitality, many servants, and bred up many children, and abominated the thoughts thereof, and so will wee prevent it if we can; wee will toyl and moyl all our dayes, and breed up our children to keep sheep, horse or beast, kick up their heeles upon a bank, flit our horses, and breed them up to take our inheritance of Thirty, Forty, or Fifty pounds by the year, with which few can scarce bring both ends together by the yeares end, as dayly experience shewes, they not once considering the fruit of Idleness, nor the great Improvement of this honest equall Enclosure, nor their childrens ruin for want of learning, Trade, or good breeding, the least whereof is better, or may be better to them than all their lands. Witnes

thousands in England that prefer their children better with a little good breeding, with little portion, than they can or usually do with all their inheritance.

The second extreme is as like the former as can be, and is so prejudicial to the Common-Wealth, and destructive to good husbandry, and it ariseth out of base private humour of sloth and self-will, and want of a wise Spirit of discerning in Improvements, and because he seeth some men have abused their Pasture-Land by over plowing, and took out the Spirit and life thereof, that it will not come to it self of many yeares (which is an ill piece of providence indeed) therefore he will not plow any old Pasture Land at all, upon any termes, or for any time, no though his Land be so decayed and impoverished, that that Land which would have maintained much cattell, will not now maintain so much by one third part or a quarter, as it did after the first through soarding: and by reason either of the wet and cold year, or the overpowering of the moss or Anthills, or some other trash; it puts not that proof into Cattell, nor scarce half, as it did at the first Scarding; nay though it calls loud for plowing, and will be much bettered, and the Rent doubled, yet he will not have it plowed come what will; What saith he, destroy my old Pasture, my sheep-walkes, and beggar my Land? all the world shall not perswade him to that, you may as soon perswade him not to eat good wholesome food, because some men overcharged their stomacks by excess here; because here and there an indiscreet man did wrong his Land by excessive plowing, he will not use it at all, not moderately, though he may Mend or better it thereby; No saith he, I can raise a constant profit by my Wool and lamb, my fat beef and mutton, at an easie quiet way unto my self and family without much vexing or turmoyleing, (which is a gallant way of living, and I shall exceedingly advise and commend it too, untill the Land degenerate, and calls out for plowing, or the Common-wealth calls out for corning, and will yeeld far better advance thereby) he takes more content in a Sheep-head and his dogg, and in his own will and ease, than in greater advantage; and

as the other Extreme will hinder all Improvements he can by way of Enclosure under pretence of overthrowing Tillage (though a man may till as much & get far more Corn in Pasture than in Common if he will) so will this out of as vain and senseless pretences hinder all Corning in pasture, lest he should prejudice his Land for grazing, although he may moderate corning, and better his Land to grazing also; so have I erected a Sea-mark upon both these Rocks, that all men may take heed of dashing themselves thereon, the Ingenious I am sure will never come near them. But for satisfaction to the first extreme maintayned by that generation of strange men that oppose Enclosure, yet see every day the Rents of those Lands Improved, some doubled, some more, some less, and the Land certainly advanced by it, one Acre made worth three or four, and after a while will bear more Corn without soyl for three or four year, than divers Acres as it was before in Common, that only say Enclosure may as easily be made without depopulation as with it; and to the other Extreme.

I am not ashamed to maintain, as a reproof to this Extreme, that many ten thousand Acres of Land in England, may yeeld a double profit divers yeares, by plowing, and afterwards yeeld as much rent as ever before, and possibly much more; Nay, I'll say, observe my Directions punctually; and I'll make good the old Rent the very first year, after Plowing, and begin to enter upon it as soon as the Crop is reaped off, and begin my year with Winter too, which is accounted the worst advantage to the Tenant, and so for Seven, Ten, or Twenty, upon many sorts of Lands in England of the aforesaid Value; But to stop the mouths of such Madcaps in each Extreme, and make good my Proposition, I will begin and try whether I can hold out Enclosure without any Depopulation, or the least prejudice, and then proceed to a full answer to the rest.

And secondly that your Arable or Common Field Lands, or common Heathes, Moores or Forrests may be highly Advanced; that is out of question I suppose, denied scarce by any, that have had seven yeares Experience of the

Enclosure held forth without Depopulation.

Disproportion betwixt the profits of one Lordship in Common, and the next adjoyning to it Inclosed; The one worth three hundred pounds in Common, the other near a thousand in Pasture.

Now here lyeth the Trick indeed to make this Improvement; and neither Prejudice Poor, nor Minister, Labourer nor Farmer, Tenant nor Landlord, One or Other, that hath any proper Right of interest therein, and not Depopulate.

For the holding forth of which, I will Demonstrate such a Method, or way of Enclosure (without Depopulation) as all men in particular shall have a Proportionable Advance thereby, and the Common Wealth a double or Treble, and Tillage advanced also, and so the one Extreme prevented, and no man hindred, all which shall admit of no other Inconvenience than this, *viz.*

The grandest
evill of a just
and equal Inclosure pre-
vents Idleness
and Oppression
onely.

Enclosure pre-
vents the Rot
of sheep excee-
dingly.

Inclosure may
occasion more
work done at
an easier
charge.

The prevention in great measure of Idleness & Oppression; 'tis true it will remove or take away it may be a Shepheard, or a Boy or Girl from keeping Cattell, who are more fit for Schoole or Trade, and put the Shepheard to the Spade, or it may be prevent some great Oppressor of the Commons, that drives off all poor Commoners off their Commons by his great Flocks and Heards, whom this Project may drive off his Sheep walkes, who lives just upon the Common side and eats out the Poor, and others that live more remote; And also happily prevent a Rot especially when tis Soarded, which usually is once in four or five yeares in most part of this Nation, which destroyes all before it, and consumeth the Care and Paines of the Oppressor too and others together, of all other yeares profit at once; And possibly may for a little season bring down the price of Sheep, Cattell and some other things (by reason of plenty of Sheep so suddainly destroyed) being of so ill a name, to a low rate; Which were it not for that Rotting Deluge their increase would be beyond *Arithmetical* Demonstration; But for a long season afterwards raiseth them to a double Rate immediately again: And possibly it may be as an Engine to facilitate most parts of Husbandry

bandry, and cause a great deal of work to be done with fewer hands, and yet before the Discourse be ended, I'll find all sorts of work enough to all mens Advantages whatsoever; and these are the Inconveniences of Inclosure and good Husbandry, others I know none; the conveniences follow also, if any more or greater shall be proposed I shall endeavour to Answer them in the Sequell.

CHAP. XII.

Sheweth the Lands capable of Enclosure, and the Method of it; how it Advanceth the Publick Weal and all particular Interests.



And to this end consider that all Lands capable of Enclosure, are either Common Fields and Arable Lands, Mens proper Right and Inheritance, or else Common Pasturing upon Heaths, Moor, Marshes, or Forrests Lands. Lands capable of enclosure.

For the Enclosure of your common field, Arable Land, I lay down this Direction; All Interests to be provided for, which I conceive may be reduced to these four.

1. First, either Lord of the soyl or Landlord, or,
2. Secondly, the Minister to the People, or else
3. Thirdly, the Frecholder Farmer or Tenant, or lastly and
4. Fourthly, the Poor Labourer or Cottier.

All which having some Interests more or less, shall be seriously considered of.

Therefore I begin with the last, the Poor Cottier, or Cottier provided for. day Labourer, and to provide for him, because he hath ever been oppressed if any, and last or least provided for, And look what right or Interest he hath in Common, I'll first allor out his proportion into severall with the better, rather than with the worse, a Proportion out of every mans Inheritance, and so

to much, or so many Cattell as he may keep in Common, he shall keep in Pasture, or rather more, at as easie a rate as they pay for it in Common, for their lives that now live upon it, and ever after at an under Value; and so I cannot possibly conceive that he hath any cause to be offended.

Labourer provided for.

And for the Labourer, you shall see how I shall provide for him too before I have done, besides the allotment of his Proportion, as to the Cottier, or to what Right soever he hath of doe or Custome.

Minister provided for.

Tithes not Gospel wayes maintenance.

Then for the Minister in the next place, because he hath seemed to be the Opposer of it, most usually: And truly so he had good reason, as the state of things formerly stood with him: (For though I believe that Tithes are neither consonant to a *Gospel Minister*, (the List of which dispute becomes me not, nor I intend not to enter in) nor yet Conducing to a sweet Compliance with his people) Yet I also say, that should a Minister either have accepted the peoples benevolence of our ordinary *English* Parishes for his pay, Or have stood to the Courtesie of the Lord, or Freeholder, what he should have had upon the Inclosure; I fear, for the one it would have been too little for a Ministers Maintenance, and for the other, he might go barefoot, and his Family a begging, for what the Common people would Contribute to his Subsistence,

And therefore would have him to have his Proportion next, and a very substantiall Livelihood allotted out of the Lands inclosed, untill the State shall settle a more better or more suitable way of Maintenance for him; If there be either a Competent number of people for him to preach unto, or Competency of Land to raise it from in every Parish, or else two or more Parishes that joyn conveniently to be laid together, (And according to what his Right or Proportion) (if he have is in way of Tithing) to be inclosed, or cast into pasture for him by himself, with as much Conveniency for his dwelling as may be.

And where either Inclosure cannot be agreed upon, or made (as possibly in some parts it may not Consist with all mens advantages) I conceive there may be an agreement
mad:

made for the allotment of the Ministers proportion, to be cast into Pasture, so that were his Tenth Enlosed, it would be so gallant a maintenance for him and, contentfull to all Partier, that it would remove all troubles, or occasion of Confusion, and Increase Love and Unity, which Tithings have ever occasioned Divisions and Contentions: Which either he may employ his Wife and Family upon part thereof for necessary Maintenance, And set (with much more ease) the rest to free his Family from Care and trouble: And so receive his pay every half year without the least Distraction. I would have him to have such a large Allotment and Proportion, as might inable him to be Capable of Hospitality, of which he is to be a Lover, & far better able to give than to receive, and to Administer to others, than to be administered unto by way of Charity.

1. Tit. 2.

And as for the great depopulation in the Nation that hath devoured poor & Tenant, overthrow Cornings and good Husbandry, and in some parts Minister and all, and yet persist by keeping their Land from Tillage when it wants it; when Country, the Landlords profit, the Markets, the Labourer, Poor, and Land it self and all calls for it, is no less than grand oppression.

Depopulation
reproved.

As also for other places where no maintainance is assigned for the Minister, but the people starve for want of bread, and where those great Improprizations are that devour all the Profits, and have all to a short-coat Vicaridge; How these things should be mended, is infinitely beyond my Sphere; how Ministers should be raised, maintenance and all Interest preserved, I know not; only I shall pray the wise God to direct our highest Counsells in regulating these distractions, for it is far beyond my shallow capacity how to advise.

Improprizations
to be thought
of.

And for the Free-holder Farmer or Tenant, I question not the Free-holders offence, for he having his proportion I know it will be doubled and more to his advantage.

Free holder.

And for the Tenant let him also share in some Advancement, either let him enjoy it at an easie rate, that look whatsoever Bargain he hath in common by the year, he

may have a better upon the Enclosure; or else let him take a Lease for Lives, or Yeares, that as he enjoys the worst, upon the first Inclosure, so he may have the best also, having a good Term of time ther ein, and then I hope he will not wrangle neither; for I am sure he need neither Moyl nor Cark as he did before, but manage his business with more ease, sweet content, and advance of profit.

Lord of the
Soyl or
Landlord.

And for the Land-Lord, or Lord, I shall not much bespeak his favour, or Approbation, for he will beleieve me without Demonstration, that there will be a visible and considerable advance fall upon him, onely crave his patience, that he'll not be offended, that I seem (and but seem so to do) to project to give away his Right as to the Poor, which in Common is their own, whether by Right Custome, (for I speak of no other in this place but such as have right of Common) and so they may require so much by Law; but to encourage them, and to remove offence and scandal I advise it. And when all these particulars concerned in their severall Rights are satisfied, we shall do well; and yet the great Block and Prejudice is yet to be removed, which is, the destruction of Corn, and Tillage, which I promised to clear, which followes here.

How Inclo-
sure shall not
prejudice the
increase of
Corn or
food.

Four argu-
ments to prove
the advantage
by Enclosure,
and that more
Corn may be
raised being
Inclosed than
Common.

First I endeavour before Enclosure, that either by ingagements so firm and surely made, by all parties concerned in it, as they may fall under Law to be recovered; Or else by a particular State Law enacted to this end, so to ingage all men in this new Inclosure to allot, or cast out one third part or thereabout at least of all their Lands constantly for Tillage, or what more at any time they please; One third part for Meadow, And another third part for Pasture, or feeding Land, which third part for Tillage if my conceptions fall not, First with the help of all that Soyil that the Hay of the other third part will raise in maintaining all the Cattell in Winter, that they Pastured in summer upon the other third part, which I conceive may be as many more; and also.

Secondly, by that advantage there will be sometime Plowing on Pasture, and resting Another, whereby fresh Land

Chap. 13. *Rencement of Land to pristine Fertility.*

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Land and Restey for some years will bear more Corn without Manure, than it did before with it, and indeed also after some yeares of resting may stand in need of Plowing, and possibly may advance the Land by it, as I am sure they will all our Wood-land, coarser Lands whatsoever, that are either subject to the Moss, or Rush, or Ant-hills, whatever it will do to better.

Thirdly, well knowing (that without question) one Acre of well Manured and Husbandryed Land, will yeeld more fruit than two or three otherwise; A principle undeniable.

Fourthly, consider the vast advantage there will be by Husbandring a little well, I say, it is clear some one Acre manured, plowed and husbandred in season, and unto that height of Richness the Land and seed sowed doth require, may and doth usually bear as much Corn as two or three ill husbandred as aforesaid. Then ballance the Business, and weigh but the advantage. One Acre beareth the fruit of three, the two Acres are preserved to graze, the seed and all other charges of two Acres is preserved to help the Markets, The Husbandry, and Plowing, and sowing of two Acres is also saved. Oh consider it, and neither be such Enemies to the State, nor of your selves and Common-wealth, so great Abusers of Ingenuity and Good Husbandry, so great Traducers; When men have their Lands enclosed, and at their own command, I fear not but most men will covet to Husbandry every Acre so well, as it may yeeld forth the utmost fruit it is possibly able to produce, having the rest at their own Command also, to imploy to another Advantage. Which done half the Land in *England* thus managed would yeeld more than all that now is under Tillage. This Poor Piece by the by observed, and practised, would make good the Improvement promised, consider it well and be convinced, or reply.

One Acre
brings forth as
much Corn as
three.

Fifthly, if you consider that all your Common Fields were never under Tillage neither, As great part Sades and Hade ways, and a great part Meadow; and much and many Balkes between each Land, and many High ways, and some

commune of Pastures and Leayes left for keeping Beasts or Sheep upon, all which will contain one third part, as I conceive, if not near half in some places, not under Tillage but wast Lands, Certainly I conclude there may be as much Corn got by Ingenuity upon this lesser quantity of Ground, and much more being inclosed, than upon it all in Common; And that there cannot be any destruction of Tillage upon all these Wasts and Grazed parts which ever lay to Grasse, and no Tillage was upon them, so that I must clearly conceive, were one third part upon all Enclosure, allotted out or covenanted to be kept constantly in Tillage, though I advise not to keep the same third part alway in Tillage, but sometimes one part, and sometimes another, all making up one just third part, would raise as much Corn as all did in Common.

And lastly Enclosure cannot destroy Tillage the Staff of the Country, because it ever yeelds most profit, nor will, nor need all be converted to Pasturage: *Cain* and *Abel* were born and planted together, and ordained to live together, and if there were any danger of one destroying the other, Tillage is likelier to destroy Pasturage, because *Cain* slew *Abel*; but without a fear the Ploughman and the Shepheard may do best together in a Common-wealth.

CHAP. XIII.

Sheweth the Excellency of Tillage, and the great Profit thereof, and the great Advance is made out of severall Enclosed Countries beyond Champain, as also the great Improvement of Heaths, Moores, and Forrests, which will dismiss those needlesse feares of overthrowing Tillage.

NOW Tillage yeeldeth the greatest profit to Land-Lord or Occupier, study especially the Good Husband to convert thy Land to the best Profit, And that is held and maintained by all men to be by Tillage, else why do men give double Rents to Till and Plow above what they do to Graze, and if thou art not yet satisfied, consider but the Wood-Lands who before Enclosure were wont to be releeved by the Fieldon with Corn of all sorts, And now are grown as gallant Corn Countries as be in England, as the Western parts of *Warwickshire*, and the Northern parts of *Worcestershire*, *Staffordshire*, *Shropshire*, *Derbyshire*, *Yorkshire*, and all the Countries thereabouts, and all the Chalk Countries both South and West-ward.

Tillage great profit.

Also consider the Chiltern Countries, and you shall find, that were it all Inclosed men would Plow little or no whit less than now they do, because nothing else nor no way else would yeeld the like advance.

Consider *Hartfordshire*, *Esse*, *Kent*, *Surry*, *Sussex*, *Barkshire*, *Hampshire*, *Wiltshire*, *Somersetshire*, and all the rest, All which

not onely raise Corn for themselves, but to supply that great City that Spends as much as all those Countreyes, and far more: And yet no parts of *England* set at greater Rates or makes greater Advantages by Grazing, and yet the greatest part thereof upon Tillage, and Corning. And what Country not almost though Inclosed, yeelds the greatest profit by the Abundance of Corn produced; But if all that I have said be not enough, I have enough I am sure before I have done.

As for your Heathes, Moores, and Forrest Lands, I shall onely speak thus much, That vast and Incredulous are their Capacities of Improvement in generall, referring the particular wayes of Improvement of every sort, and differing natured Land, as they fall in the fourth or sixth Piece of Improvement to avoid prolixity, because the very same Ingredients, Compositions, and Directions, are suitably and naturally appliable to these Lands, as to those to which they are prescribed.

Onely Right
in Commons,
not Vsurpers
I speak to.

Therefore I onely say that all Interests in these Commons, or Rights of Common Pasture, upon any of these Lands, may without Prejudice to any particular Interest, be advantaged, and much Improvement made to the Publique; I speak not to inright the Usurpers of right wrongfully maintained, or Oppressors of any other mens Rights, I desire that Right might onely run in its proper Chanell.

At the first
Enclosing of
any Common,
how to cast
out Land to
the greatest
Advance.

First in generall by the same Method of Enclosing, held forth in this third generall Piece of Improvement, touching Common Field-Lands, if thereto, before Enclosure you do but add the Method or Drought of first casting out your Lands, and plotting them into such Plots and Formes, so that where there is or may be a Capacity of bringing thy Land under any good Stream or Land-flood, be sure to cast it for Meadowing, having drawn one Master Level floating course throughout thy whole Plot of Enclosure, which may also serve as thy first division; and to carry thy water along also to flow thy Meadowing thou shalt make all under it fit, that thou mayst not lose that Opportunity now at first, (which after divisions made cannot be had) of so great an improvement,

provement; at so small a Rate, now at thy first contrivance thou mayst cast it under, and then cast out all thy Lauds, according to the most suitableness of them, all to such Improvements they lye under, and then to the Conveniencies of each mans Right and Interest, and the greatest Advancement upon these Inclosures will be two.

The first giving all Ingenuous men a Capacity to Plow, and Till what they please thereof, which will raise a double, or treble Advantage, as to Grazing, and a Tenfold greater Advance as to Common of Pasture (which to some is worth nothing at all, because of their remoteness, to others but little, because of some great Oppressor, nearely and neatly seated upon the Commons, that drives others from it) and to none what it may be, as by right, when he may use all his Parts, Purse, and Experiences of Husbandry at his own pleasure by improving it; And it is and never was otherwise seen, that men would ever joyn together in one body, to use their utmost to improve any of these Lands to the best Advantage; for though Common of Pasture is mens own Inheritance, and every man not knowing his Lot, or Portion, how rarely will they ever joyn or agree therein? although they are all perswaded of a probable great Advancement, yet one sayes, I shall not have so great an Advantage by it as my neighbour; and another he believes it will be good for present, but it will not last; and an another sayes, he hath no reason to bear so great a proportion of Charge, though he have as much Land, yet he's not capable of so great an Improvement; and another saith, I could be well content to help on any publique work, if others would, but for me to bestow cost and improve my Land, or commons, for others that will bestow none to eat and bite up my cost, much discouragerh him, and indeed there is some Reason for his backwardness; and a thousand Excuses and Cavils there must be, which though a wise man may easily answer, yet never convince their Judgements, for it hath ever been so since their dayes, and their Fore-fathers were as wise as they, and they cannot be satisfied, let it alone and wee'l take the present profit it yeelds, and there is an end of their Improvement.

And

Two Advantages of this Enclosure.

Cavils against Improvement in Common.

3 Piece. *Englands Improvement: or,* Chap. 13.

And here I'll give you a President, which though it might as to the nature of it, have come in more seasonably in the discourse about common Field Land, yet here it is very naturall also, both as to the end I bring it for, and for the discovering a Capacity of a vast Improvement, both upon it self, and upon all other Lands of that nature.

A President of
great store of
lost Land under
puddle
hill capable of
Improvement.

There are many hundred if not thousands of Acres of Lands near *Dunstable*, in a Valley under *Puddle*, or *Chalk-Hills*, just under the bottome of the Hills (an eminent place known well to most) which I believe runs both wayes far, but on both sides the Rode-way to *Coventry* and *Vestchester* the Land lyeth, with a little Brook, or stream running through it; All which Lands if you observe them above half the year ly full of water, if not under water, and I believe it is worth about five shillings an Acre, I am sure abundance of it is not worth three shillings, and some not worth two shillings an Acre, which if my Judgement fail not, may easily be drained, and laid so found and wholesome, which were but that done as it should be, or but according to the second Piece of Improvement, and the directions given in the seventh Chapter, treating of draining, I dare uphold one Acre would be as good as divers now are in many parts of it, but then should you also by the benefit of that Brook, and all these gallant rich Land floods that issue from the Hills on one hand, and from the Vale especially on the other hand, take the advantage and benefit of them also, and according to the first Piece Improve it by Floating, which may very Feazibly be done according to the direction of the fourth, fifth, and sixth Chapter, whereby it may be Improved to its utmost. I verily believe it would not only make good the utmost extent of my Improvement promised, but will afford Hay sufficient to supply all those Barren parts, and that as good again for the nature of it, if not thrice so good as now it is; I Instance this place the rather, because it is so obvious to every one, and so well known to most, and this offer of Improvement was once tendred to them, who could not agree therein, but made many of the Objections aforesaid, although it was offered them to be done.

An offer made
once to have
made good
the same.

done at anothers cost and charge, and they to have run no Hazzard, but to have come unto so great an Improvement paying the cost and charges, if the design had taken after they had seen it wrought unto their hands: but there are a thousand, and ten thousand Acres up and down the Nation, some yeelds more, and others less hopes of vast Advancement, and all great enough if men would put them upon tryall, and great and vast quantities of Land in many Forrests, Common Fields, and other Heaths, Waits, Moores, and other Commons, subject to the greatest Improvements at little charge, which will never be done till men know their own.

And were every mans part proportioned out to himself, and layd severall, it would so quicken and incline his spirits, that he would be greedy in searching out all opportunities of Improvement whatsoever the Land is capable of; As by Lime and Marl, Muck, Soyl, Marl, Lime, Earth, Chalk, and Mud, &c. With many other wayes, (all which men will infinitely more pursue when they know their own, than while it lyes at random; And a Monarch of one Acre will advance more profit of it, than he that hath his share in an hundred Acres in common) which will more naturally fall into the next Piece and there shall be particularly handled, whereby great store of Corn of all sorts (where now not one Grain is Tilled) may be gained, which raiseth Straw, Stover, and Fodder, abundantly for raising Soyl, Dung, or Manure: An old, and the onely infallible, and undeniable meanes to advance any Land whatsoever. I shall digress a little because all men talk of Husbandry, and good Husbandry too, and especially of much excellent Husbandry near and about *London*, where Soyl is so plentyfull, that half of it is scarce used, though so much needed, and so unspeakably advantageous, and yet so few practise Husbandry to purpose, though under such great opportunities, but few practise to purpose, else what meanes all those Barren Lands (though not Common Lands) lying within some two miles, other three, four, five or six of the great City (where all men are said to be the most gallant Husbands of

2 Advantage of this Enclosure.

III husbandry discovered along the River Thames both wayes much barren Land near London.

the Nation to lye unimproved, all Heath, or Ling, or Broom, not worth three, four, or five shillings an Acre; surely were there either Soyl to be had at *London* for Mony, as indeed there is enough to be had without; nay in many parts men may have Mony to carry it away, else were there a River to Barge it up and down, men would Improve it to great worth; Many hundred, if not thousand Acres in *Essex*, *Kent*, and *Surry* are neglected; certainly Land is worth Money, and Money enough, too (if I be not mistaken about *London*; And then by these meanes when the same shall be laid down to Graze, observing but the particular Directions aforesaid, it shall feed, and fat, where before it kept but store Cattell alive; much more might herein be said, but I'll say no more, for if the Presiding these experiences will not satisfie and abash the Oppressor, I am sure I shall shame my self by my Prolixity, and therefore I'll stop the Black-moore no more, untill he manifest his offence at what I have said, by way of return in the same kind, but if he delight more in Rime than Reason or Experiences, Take Mr. *Tusser* speaking in his Husbandry of the great Advantages betwixt Enclosure and the Champion Countries, and betwixt Slothfulness and Ingenuity, and I will give it in his own Phrase, which I conceive may please thee better, and he speaks very good Reason also by his *Rimas*.

By Master *TUSSE*R 106. Pag.

Chap. 52.

A comparison between Champion-Country and Inclosure.

THe Country Inclosed I praise,
The other delighteth not me,
For nothing the Wealth it doth raise

To

To such as inferiour be.
 How both of them partly I know,
 Here somewhat I mind to show
 Their Swineheard that keepeth the Hog,
 Their Neatherd with Curr and with Horn,
 Their Sheepheard with Whistle and Dog,
 Be fence to the Meadows and Corn.
 Their Horse being ty'd on a Bulk,
 Is ready with Thief far to walk
 Where all things in common doe rest.

Corn-field with the Pasture and Mead,
 Though common ye do as the rest,
 Yet what doth it stand you in stead?
 Their Common as Commoners use,
 For otherwise shalt thou not chuse:
 What Lair much beteter then there?
 Or cheaper thereon to do well?
 What Drudgery more any where?

Lesse good therefore, where can ye tell?
 What gotten by Summer is see
 In Winter is eaten up clean,
 Example by Liecestershire,

What Soyl can be better than that,
 For any thing heart can desire?
 And yet they want ye see what,
 Mast, Covert, Close, Pasture, and Wood,
 And other things needfull is good,
 All those do Inclosures bring,

Experience teacheth no less,
 I speak not to boast of the thing,
 But onely a truth to expresse.

Example (if doubt you do make)
 Of Suffolk and Essex go take,
 More plenty of Mutton and Beef,
 Corn Butter and Cheese of the best,
 More Wealth any where to be brieft,
 More people more handsome and prest
 Where find yee? Go search any Cost,

*Than there where Inclosure is most,
More work for the labouring-man,
As well in the Town as the Field,
Or therefore devise (if you can)
More profit what Country doth yeeld.
More seldom where see yee the Poor
Go begging from door to door?
In Norfolk behold the despair*

*Of Tillage, too much to be born
By Drovers from Fair unto Fair,
And other destroying the Corn,
By Customs, and Covetous Pates,
By Gaps, and opening Gates.
What speak I of Commoners by
With drawing all after a Line,
So noying the Corn as it lye,
With Cattell, with Conies and Swine?
When thou hast bestowed the cost,
Look half of the same to be lost,
The flocks of the Lord of the Soyl
Doe yearly the Winter Corn wrong,
The same in a manner do spoyle,
With feeding so low and so long.
And therefore that Champain Field
Doth seldom good Winter Corn yeeld.
By Cambridge a Town I do know,
Where many good husbands do dwell,
Whose losses by Lossels doth shew,
More here than is needfull to tell.
Determine at Court which they shall,
Performed is nothing at all,
The Champain robbeth at night,
And proleth and filcherh by day,
Himself and his Beasts out of sight,
Both spoyleth and maketh away,
Not onely thy Grass, but thy Corn,
Both asier, and ye'er it be shorn,
Pease bolt with thy Pease he will have,*

His

His household to feed and his Hog,
Now stealeth he, now will he crave,
And now will he cozen and cog.

In Bridewell a number be stript,
Less worthy than Thief to be whipt.
Lord if you do take them what stirrs?
How holdt they together like Burs?
For Commons these Commoners cry,

109. p. 160.

Inclosing they may not abide;
Yet some be not able to buy

A Cow with a Calf by her side,
Nor lay not to live by their work.
But Theevishly loyter and lurk.
The Lord of the town is too Blame

For these and for many faults moe,
For that he doth know of the same,

Yet lets them unpunished goe.
Such Lords ill Example do give.
Where Varlets and Drabs so may live,
What foot-paths are made and how broad?
Annoyance too much to be borne,

VVith Horse and with Cattell what road
Is made through every mans Corn?

VVhere Champains ruleth the rost
There daily disorder is mast,
There Sheep when they drive to wash,
How careless their Sheep they do guide?

The Farmer they leave in the last
With losses on every side;

Though any mans Corn they doe bite,
They will not allow him a mite.

VVhat Hunting and Hawking is there
Corn looking for Sickle at hand?

Acts lawless to do without fear,
How yearly together they band?

More harm to another will do,
Than they would be done so unto.

More profit is quieter found,

Where Pastures in severall be,
 Of one silly Acre of ground,
 Than Champion maketh of there.
 Again, what a joy is it known,
 When men may be bold with their own?
 The tone is commended for grain,
 Yet bread made of Beanes they do eat,
 The tother for one loaf hath twain,
 Of Meslin, of Rye, and of Wheat.
 The Champion liveth full bare,
 When Wood-land full merry do fare.
 Tone giveth his Corn in a Dearth,
 To Horse, Sheep and Hogs e'ry day,
 The other give Castell warm barch,
 And feeds them with straw and with Hay.
 Corn spent of the tone so in vain,
 The tother doth sell to his gain.
 Tone barefoot and ragged doth go,
 And ready in Winter to starve,
 When tother yee see doth nor so,
 But have what is needfull to serve.
 Tone paine in a Cottage doth rake,
 When tother trim Bower doth make.
 Tone layeth for Turf and for Sedge,
 And hath his ponderfull suite,
 When tother in every hedge
 Hath plenty of Fuel and Fruit.
 Evill twenty times worse than these,
 Inclosure quickly would ease.
 In Wood-land the Poor men do live,
 Scarce fully two Acres of Land,
 More mercily live and do save,
 Than tother with twenty in hand.
 Yet pay they as much for the two,
 As tother for twenty must do.
 The Labourer coming from thence,
 In Wood-land to work any where,
 I warrant you goeth not hence.

To work any more again there.

If this same be true (as it is)

Why gather they nothing of this?

The Poor at Inclosure do grudge,

Because of abuses that fall,

Lest some man should have too much,

And some again nothing at all;

If order might therein be found,

What were to the severall grounds?

Consider well many Solid demonstrations of truth in these particulars, he speaks very much Reason and as much Truth, his observations are very good; nor is it the single opinion of Mr Tusser and my self, but of all that ever I yet saw or read of these subjects of either good husbandry or the best way of Improvements of Lands, but ever advised & persuaded to this, as ever you would study your own, the Common-wealth, but especially the good of your Posterity, endeavour & prosecute such an Enclosure that is not nor can appear to be any particular soules hindrance. Tis true I have met with one or two small Pieces, as M. Spriggs, and another whose name I remember not, that write against depopulating Inclosure, with whom I freely joyn and approve, such as former oppressive times by the will and power of some cruell Lord either through his greatness or purchased favour a Court, or in the Common Courts of England, by his purse & power, could do any thing, inclose, depopulate, destroy, rhine all Tillage, and convert all to pasture without any other Improvement at all, lay Levell many honest families to the ground, dispeople a whole parish, and send many soules a gooding, a cursed horrible oppression, which for my part I would it were Fellony by the Law, which I think really is no better, which hath brought men to conceive, that because men did depopulate by Enclosure, therefore it is now impossible to enclose without Depopulation, but against Enclosure it self, meerly to convert it from a generall promiscuous Common age, to a division or distribution of every ones share and Interest therein to his own particular possession, use, and occupation, to manage husbandry

bandry, and Improve as he shall like best, both for manner, time and charge, I never yet did see or read any to avouch the same, but should be very willing to meet with such an Antagonist, for whom I am prepared, and will If God please to give opportunity in mild and loving way endeavour to convince him of his rash mistake: but should any man take offence at Enclosure as of it self, as I verily believe none doth, yet at such a way or Method of Enclosure as is here held forth and discovered, that provides as much for the raising and increase of Corn and all Grain, as for supply of Pasture and Meadow, and provides for all Interests their proportionable Advantages, I hope very Doggs themselves will not move a Tongue.

See Mr. *Harlip*
his legacy page
56.

And as for old writers, so for new and late ones they all with one consent encourage to Enclosure & Improvements, some affirming that the great benefit of the Sheep their Wool that Staple Commodity of England doth Imploy more people by far on every Acre than by Corning, which may possibly be so too, but I am sure that in a way of Improvement, which I hold forth, it must needs more advantage the Common Wealth than lying wast in common and unimproved. And if thou peruse Mr. *Harlips* book printed two year since, wherein he handles it very demonstratively well worth thy reading, will confirm the same. And if thou wilt peruse learned *Fuller* in his holy state, you shall see the Excellent advantages and Improvements may be made to all by an Enclosure without Depopulation, in the fifth book 13. Chap. page 91. most Excellently handled and cleared.

Studie therefore the management of all thy estate to the best publique Advantage, Husbandry all thy Lands to the best & greatest benefit of the Common Wealth, for in this way of Improvement thou canst not possibly intending the publique good, but necessarily the greatest good must follow to Poor, thy self and family.

Order therefore thy common Arable Lands, as they also may raise and produce their most plenty to all Concernments, and all Wasts, Forrests, and Heathes, that they may produce their

their great advantage, which bring so old and rusty, will
yeeld forth Corn in great abundance, and after Pasture to
double profit. Bée not peevisly, nor let not passion nor old
customed corrupted Will prevaill against these Advantages,
for he that Improves not all his Land to this end, the saying
pleide, and relieving the miserable, answereth not the ends
wherefore thy self and all thy Lands were given, as before I
hinted. I have no more to say to thee, but to intreat thee to
remember that passage of the Wise Man (*viz*) *The thoughts of*
the diligent bring abundances. And if thou wilt be yet unsatisfi-
ed, be so still.

as a medicine to shew the
that will be his
shall ever be the predominant
the Noble Commonwealth in the Nation
and therefore many private
Improvement of other

First, to a third
Second, to a fourth
Third, to a fifth
Fourth, to a sixth
Fifth, to a seventh
Sixth, to an eighth
Seventh, to a ninth
Eighth, to a tenth
Ninth, to an eleventh
Tenth, to a twelfth
Eleventh, to a thirteenth
Twelfth, to a fourteenth
Thirteenth, to a fifteenth
Fourteenth, to a sixteenth
Fifteenth, to a seventeenth
Sixteenth, to an eighteenth
Eighteenth, to a nineteenth
Nineteenth, to a twentieth
Twentieth, to a twenty-first
Twenty-first, to a twenty-second
Twenty-second, to a twenty-third
Twenty-third, to a twenty-fourth
Twenty-fourth, to a twenty-fifth
Twenty-fifth, to a twenty-sixth
Twenty-sixth, to a twenty-seventh
Twenty-seventh, to a twenty-eighth
Twenty-eighth, to a twenty-ninth
Twenty-ninth, to a thirtieth
Thirtieth, to a thirty-first
Thirty-first, to a thirty-second
Thirty-second, to a thirty-third
Thirty-third, to a thirty-fourth
Thirty-fourth, to a thirty-fifth
Thirty-fifth, to a thirty-sixth
Thirty-sixth, to a thirty-seventh
Thirty-seventh, to a thirty-eighth
Thirty-eighth, to a thirty-ninth
Thirty-ninth, to a fortieth
Fortieth, to a forty-first
Forty-first, to a forty-second
Forty-second, to a forty-third
Forty-third, to a forty-fourth
Forty-fourth, to a forty-fifth
Forty-fifth, to a forty-sixth
Forty-sixth, to a forty-seventh
Forty-seventh, to a forty-eighth
Forty-eighth, to a forty-ninth
Forty-ninth, to a fiftieth
Fiftieth, to a fifty-first
Fifty-first, to a fifty-second
Fifty-second, to a fifty-third
Fifty-third, to a fifty-fourth
Fifty-fourth, to a fifty-fifth
Fifty-fifth, to a fifty-sixth
Fifty-sixth, to a fifty-seventh
Fifty-seventh, to a fifty-eighth
Fifty-eighth, to a fifty-ninth
Fifty-ninth, to a sixtieth
Sixtieth, to a sixty-first
Sixty-first, to a sixty-second
Sixty-second, to a sixty-third
Sixty-third, to a sixty-fourth
Sixty-fourth, to a sixty-fifth
Sixty-fifth, to a sixty-sixth
Sixty-sixth, to a sixty-seventh
Sixty-seventh, to a sixty-eighth
Sixty-eighth, to a sixty-ninth
Sixty-ninth, to a seventieth
Seventieth, to a seventy-first
Seventy-first, to a seventy-second
Seventy-second, to a seventy-third
Seventy-third, to a seventy-fourth
Seventy-fourth, to a seventy-fifth
Seventy-fifth, to a seventy-sixth
Seventy-sixth, to a seventy-seventh
Seventy-seventh, to a seventy-eighth
Seventy-eighth, to a seventy-ninth
Seventy-ninth, to an eightieth
Eightieth, to an eighty-first
Eighty-first, to an eighty-second
Eighty-second, to an eighty-third
Eighty-third, to an eighty-fourth
Eighty-fourth, to an eighty-fifth
Eighty-fifth, to an eighty-sixth
Eighty-sixth, to an eighty-seventh
Eighty-seventh, to an eighty-eighth
Eighty-eighth, to an eighty-ninth
Eighty-ninth, to a ninetieth
Ninetieth, to a ninety-first
Ninety-first, to a ninety-second
Ninety-second, to a ninety-third
Ninety-third, to a ninety-fourth
Ninety-fourth, to a ninety-fifth
Ninety-fifth, to a ninety-sixth
Ninety-sixth, to a ninety-seventh
Ninety-seventh, to a ninety-eighth
Ninety-eighth, to a ninety-ninth
Ninety-ninth, to a hundred

The fourth Piece of Improvement shews how to Plow and Corn old Pasture Land so as not to Impoverish it, and double the Improvement of it for a Time, and afterward to better it for ever in a way of grazing; and will be as a medium to allay the second Extreme; and will discover that Corn shall ever be the predominant profitable staple Commodity in the Nation; and sheweth many particular wayes of Improvement of other sorts of Lands.

CHAP. XIV.



Here is a second Extreme also which men wedded to their self profit hugg in their very bosome, which is so much to their hearts content, that they never look what may make most profit to the Publique, or good of the Common-wealth, themselves, or Posterity; He is seated in way of Feeding and Grazing, with a constant Stock of Breeding, and let his Land be fit for one, or fit for another use, he matters it not, he hath received a Prejudice against Plowing, partly because of the Toyl and Charge thereof, and partly because, as aforesaid, some men have Plowed their Land so long

long as they have impoverished it much, and some men so long as it is possible it may be many yeares before it Soard Compleatly, and therefore let it be Dry or moyst, Sound or Rotten, Rushey or Mossy, Fenny, or run over with a Flag Grass, or Ant-hills, Mossure, or wild Time, let it keep more or les; hee'l not alter, tell him Sir it will yeeld abundance of gallant Corn to supply the whole Country, & raise great Summes of Money to your Purse, and afterward (if you yet Plow Moderately) it may keep as many Cattell, nay more, yet nothing takes with him, he will have no Encllosure Plowed by no meanes; yet seriously weigh these ensuing particulars, and then use thy own will and pleasure.

But to make good my promise herein, I must first remise, that my Design is mainly upon a second sort of coarser Land, betwixt twenty shillings an Acre, and ten shillings or a noble, out of all which will come a great Advancement to no prejudice at all, & is a member of one of the six Pieces of greatest Advancement promised. Although the best sort of Land of all will yeeld the greatest profit, yet not without some seeming little Prejudice to it, and also this will best continue and hold his beauty, and strength, and Improve upon Grazing rather than lose, which the worser sort will not. And of this best sort of Lands with the Improvement to be made thereon very Considerable, I shall also speak under the first and last Piece of all: And shall now set forth how the Plowing of all such Lands, according to the Design projected, which shall be a supply or filling up, and running over of the measure of plenty of Corn in case Inclosure should decrease it (which I am confident upon the consideration of the aforesaid Reasons thou canst not Imagine) and so remove that Extreme also. In which Projection I shall tell thee, that if thou wilt follow the Rules prescribed, thou shalt double the prizes of thy Lands for the present time of Plowing, and after lay it down better for Grazing than thou tookest it to plow, onely consider that of this second sort, there be three natures.

A second sort
of Coarser
Land the only
Land for
Plowing.

First, sad and moyst strong Clay and cold.

Second, Mixed with divers Earths.

Q 2

Third

Third, Warm, Sandy, or Gravelly.

The middle
sort of Clay
strong Land
advanceth it
self by Tillage.

The warm
lighter Land
advanceth
most in Corn
to the Com-
monwealth.

How to bank
Ant-hills most
speedily.

The best way
to destroy
Rush or cold-
ness in any
Pasture

The first natured Land advanceth it self most by Tillage, yet raiseth Corn in abundance also, but the two other latter natured Lands advanceth not so much in it self, as in that wonderfull increase of Corn it yeeldeth to the Common-Wealth; I verily beleeve that Lands of these latter natures are as fruitfull and kind for Corn (especially if they be resty) and for four years may produce as much increase to the Strike or Market as that Land that is as Rich again, or twice as Rich, for as to the Corning Land it may possibly sometime be too good, as alwaies too bad, I had far rather make choice of a middle sound warm Land, than of the richest and fattest that is, for this will yeeld it self and heart more to the Corn than the other, and yet this also may be bettered with wisdom used in the Plowing for Grazing also.

First therefore consider the nature of this first sort of Land, and the way of Husbandring it, to inable it to produce the promised Improvement; And so I begin with that which is of a pure Clay, or of a little mixed nature either with Sand or Gravel, and yet is of a cold temper, and so is neither so wholsome for Cattels lodging, nor so fruitfull for their Pasturing; Which sort of Land is many times over-run with Ant-hills, which are best destroyed this way, being opened, the Soard taken up, and the Coar taken out, and scattered before the Plough, will make all the Land Plow the better and also ye better, and the Mould will help a little all the parts of the Land they are spread upon. And Rushes and Moss in abundance, may many times so over-run the Land, which are so thick and noysome, that they not onely hinder the Earths naturall fruitfulness, but the Rushes are so thick and high in many Pastures, that the Sheep many times make them for their Refuge, to preserve themselves from the heat, that oft-times they are sheltered so long by them untill they be lost by the Mares, Maggots, or Vermine; A great prejudice to the Grazier, or Breeder; All which is certainly occasioned by the Moistness, and Coldness of the Lands, which will no way more certainly and

Ad.

Advantageously be removed but by Plowing these Lands, which course although by many men it be thought an Impoverishing of the Land, yet I absolutely deny the same, and affirm both from mine own Experience, and the Practice of those that have made tryall thereof; that it shall most wonderfully advance the same for present, and future; Over-Plowing indeed weakens Land; Extremes on either hand are dangerous and destructive; Food and Bread sustaineth Nature, but Gluttony destroyes it; Wine nourisheth the heart, but Drunkenness drownes it; And as over Tilling and forcing out the heart is worst, so I say, not then to Plow when the Land is run to moss, and to these corruptions, is no less bad: And being done with wisdom and moderation, is far more advantageous than not to Plow; And this my self have offered, familiarly for Lands of this nature, worth and quality, to give a Plowing or double Rent for the same according to his naturall worth for three or four years, but not above, as hath been conceived the Land hath been able to bear; And then after Plowing the very first year to give the old Rent, and take a Lease for Ten, or Fifteen, or Twenty yeares at the same rate, whereby let Ingenuity Judge what Prejudice this may be possibly; For the time of Plowing the Lands may yeeld double Rent, some more, some Rent and half Rent, and some one third part more than old Rent; All which I conceive is a great Advantage, with another secret Advantage interwoven with it, as an Addition to the State, which is the raising of a great quantity of Corn to the use of the Common-wealth, The setting of many Poor on work, The raising Straw, which wintering Cattell with, may raise such abundance of good Manure, Dung, or Soyl, as may Inrich a great part of the same, or some other Lands; and were there no other advantage but helping the Common-wealth herein, I hope no honest publique spirit would oppose it, many Lands lying under this Capacity lye in the South part of *Warwickshire* and *Worcestershire*, *Leicester*, *Nottingham*, *Rutland*, some part of *Lincolnsire*, *Northampton*, *Buckingham*, and some part of *Bedfordshire*; and in most part of the Vales in England, and

Moderate Tillage must needs advance Land

Advance for Plowing, and the old Rent the first year after

An offer made of making good a Lease after Plowing of old Rent and a great advance in Plowing.

very many parcels in most Countieys of this Nation; And this I say again, do but observe my Method, and strictly trace my Instructions, & pursue them all along, I dare make it good upon most Lands, except it be upon that which is a harsh binding churlish nature, which will also admit of a good Improvement, though not so good, especially when it shall be over-grown with the aforesaid Annoyances.

CHAP. XV.

*Sheweth the manner of Plowing, and
working Lands to so great Advance,
with two Incredible Presidents
of Advance.*

*Stratford upon
Avon Presi-
dent.*



Here is a parcell of Land in *Warwickshire*, near *Stratford upon Avon*, that is Oaded every fourteen yeares, and Corned divers yeares after that; and so there may be many more Parcels also besides this I speak of, and so I know there is, and after that fourteen yeares rest and Grazing, Oaded again and Corned also: So there are some in *Northamptonshire*, *Buckinghamshire*, and many other parts will do the like; And so runs round, Grazing fits for Plowing and Corning, and Corning fits for Grazing; A most gallant opportunitie; Doubles the Grazing-rent, while under Corning, and more under Oading; And Grazeth again immediately at a very considerable Rent, and might do the first year at old Rent, and so forward, Would they Plow but three or four yeares according to my direction, but they Plow five, six, or seven; Such a Method would please me gallantly, advance the Common-wealth exceedingly, and prejudice whom, I would fain know: Abundance of poor set on work; Abundance of Corn raised; Abundance of Straw which spent and fed upon the Land, shall make that

up

up again what ever the Plowing fetched out : Doubles Rent and more, four or five yeares in one and twenty: And so every age near fetcheth in the Purchase; And the Land where it was, and would be as rich as it was, if it be not (my directions observed) a great Estate raised out of nothing: Why not thus in a thousand other parts of this Nation, as good Land, and better, and as suitable to this Advance, and not improved to it?

O Slothstand by, & let Ingenuity try a trick or two more, and wonder at thy own Ignorance and Weakness, and now see how to work it.

Secondly, consider thy Land how it lieth, whether round The manner with Ridge and Furrow, then use your own discretion for how to Plow such Lands. the manner of Plowing; for the first year however, Plow it as well as you can possibly, both clear from Balks and Slips, and of such a stich or depth as the Land will bear; however go not under the true and naturall Soyl of the Earth, neither plow it too thick, for that will be a great prejudice to your second Plowing, because your Furrowes will rise most hard and stubborn, and so moil both Teames, Work-men and Servants, as is incredible. But if it be Lands and great Balks together, then for the Lands Plow them as you please, that is, whether Ridge-Are, or Cast them, but for your Balks before you, Ridge them all. And although it will ask paines, cost and hot water, yet fail not herein: And though the Rushes be thick and strong, yet be not discouraged; Mow the Rushes. Mow the Rushes in the beginning of Winter as low as you can possibly, and then you may with paines and patience, a good Teame, and good Ploughs with sharp Irons, all made true, sharp, and smooth, do it with incredible dexterity: Especially directions for plowing. fail none of these directions, you can not conceive the wonderfull advantage in this exactness. And were it so the Land were such as there must be required as much cost and paines with the Spade, as with the Plough, I would bestow it, and never question how it shall answer the same: For, say the cost be extraordinary, and say one Acre cost thee as much overcoming it, and laying it round, sould, and fair, as usually thou or others bestow on

Experiment of
Plowin: the
second sort
of Land and
the fruits of it.

A President of
the fruit th it
came of poor
Lands worth
but nine shil-
lings an Acre.

two or three Acres; Yet what is that to the fruit or profit it may produce? I dare say one Acre of Corn thus thoroughly husbanded may be worth two Acres, nay three slubbered over and done many times as most men commonly do therein; And what is it to lay out a five shillings or a noble extraordinary in every Acre in the Husbandry, and reap it by the Pounds in the Crop, as I dare say you shall in the two first Crops, which are the onely Crops requiring such paines and exactness. I could tell thee an Experiment if thou durst beleve it, 'tis this; I once held a Piece of Land worth nine shillings an Acre, and no more to a Graze; I gave fifteen shillings to Plow, it was great Lands, as great Balke betwixt them, full of your soft Rushes, and as high some of them as any ordinary Beast, and lay very wet; The Land conceived by me not able to bear Barley, nor never would, it was so weak and Barren, so cold and Queasie: And the neighbours very able Husbandmen round about so discouraged me (out of their love unto me) as that they desired me to forbear Tillage of it, because it would never answer ordinary cost bestowed on it, nor be worth an old Grazing-rent to Plow, and that they cleared to me by very clear Evidence as they conceived, affirming that the Land next unto it, but a hedge betwixt, which was far better Land, (and indeed so it was very near as rich again) husbanded by very able husband, the best in that Country, and that Land good Barley-Land, yet never answered the paines and cost bestowed; yet I resolving to make a full triall thereof, I set upon it according to the prescription aforesaid, Each Acre Plowing and Harrowing, Spading and Dressing (for indeed I made Harrowes on purpose also) of divers Sizes, it cost me about fifteen or sixteen shillings an Acre the two first Crops the very Dressing of it; And for these Crops, being but of Oates, I could have had five pound an Acre, being offered it by an Oat-meal man of himself, though never asked, growing upon the ground; Nay six pound an Acre, if I would have sold it, which is a vast Rate for Oates in the middle of the Nation; And indeed I found the ground so poor, that it would not bear Barley, for I tried some Acres.

of the best Land in it, but it was not worth an Acre of my Oates, and after Plowing I gave the old naturall Rent as it was ever set at or really worth, and that for many years, and the Land is better, lyeth sounder, warmer, and both yeelds more Milk, Summers as many Cattell, and Winters far more, and feeds better than it did before, without any other cost bestowed, and the very first year I layd it down after Plowing, it kept me more Cattell and better than ever it did before; and will continue better for it for ever after.

CHAP. XVI.

Sheweth the best, and most advantageous way of Plowing and Husbandring Lands, so as most to Advantage it, in laying down Land to Graze, to make good the Improvement promised, and not to over-plow, as you tender the loss of your Land.



To this end, be sure to lay your Furrowes open, and clean scoured up, and capable to receive and carry away all your standing water, or soaking moysture from your Land, and be sure so to Plow your Lands as you may cast your Lands into severall Furlongs, that you may have one Furrow or Drain run into another, and that next into another, and so into the Master Trench, which if it cannot be made deep enough with the Plow, let it be done with the Spade substantially; And so from one to another, to carry away the Water, that it may neither annoy your Corn throughout your Field in any Furlong, nor your Land

To lay open Furrows clear is very good.

when you come to lay it down, and then when you have Plowed your Lands, wherein the more truth and exactness you observe therein, the more fruit expect.

What Hard-
ness and Har-
rowing is most
advantageous.

And when you come to sowing your Lands, you must get very strong weighty Harrowes (if you would do it indeed, and not slubber it over as most do) long tined and sharp, and either they must be so weighty of themselves, that they may work a gallant strong Team to draw them, or else so loaden with weight, that you tear up rough uneven places, and raise good store of Mould, which is a marvellous great Advantage to the Corn; (as for the ordinary way of Hild- ing Land as most do, is Reproveable) and then with two or three sorts of Harrowes, each Harrow having his Teeth, or tines, thicker than other, which will so curiously and certainly cover your Corn that you will have little or none lye uncovered, but well moulded, which will have such strength, & heart unto it, as by Gods blessing you may expect a Crop answerable to your cost bestowed, and far greater.

Over plow
cryed down
and reprov'd.

The next direction is, that as I cry up plowing as a sove- raign meanes of a great Advancement, so I also as much de- cry Over-Plowing, or the Plowing of Lands as most do; some Plow as long as it will bear any corn; and others as long as it will bear good Corn; And others they Plow on any fashion, lay their Lands, as though they were over- running them, both to Corn and Graze, and when they lay it down, some lay down sound warm dry Land very high, ridge and furrow, and small Land too, very prejudiciall to their Land and themselves too, and are justly reproveable; others lay down strong cold Land flat, unopen'd, some part Plowed, some unplowed, full of balker, holes and hills; as if they would secure or ingross all the coldness and Venom of all the water and hunger that is either naturally upon it, or that falls upon it, or passeth by it; they matter not after what manner they leave it, nor after what Grain; I there- fore prescribe onely three or four yeares to Plow unto this sort of Land, and to raise it every year, not less, because the Rush, Filth, and Earth will not be rotted, nor well com- pounded, nor the nature of the Land changed with fewer

Reasons why
but three or
four yeares are
prescribed for
Plowing old
Pasture Land
neither more
nor less.

Tilks

Tilth, nor the Lands well brought to a good height, roundness, and driness in lesser time; for if it be cold Land, all that can possibly be done will not lay it high and dry enough, nor the Mould wrought to her perfect tenderness and true Mixture, whereby it may yeeld more fruitfulness; but if the Land be very rich of nature, and not well wrought, nor the Rush perfectly destroyed, nor the Lands brought up to a convenient height and roundness, then one year more may do well, which year shall yeeld the best crop out of all question, but will draw a little more from the strength of the Land, than any of the other yeares did; and if the Land be in strength, it may very little prejudice it, and therefore this I leave to every mans pleasure, upon this consideration, and could wish that all men would so Plow, as mainly intending the Advance and Betterment of their Land, especially Pasture Land, and no otherwise; For you were as good lose some of your inheritance (as you do) in my opinion, Or as good lose the Land which is but the Carcas, as the strength and vertue which is the Heart and Life of it, for therein is the Common Advantage, when the Earth yeelds most increase, or fruit, and a little parcell yeelds abundance of fruit.

Last Crop may yeeld most Corn, but worst for the Land.

Fifthly and lastly, I advise to lay down all Lands of this nature upon Wheat, Mellen, or Rye Stubble, which will exceedingly thicken and improve the Soarding, and if my Principles fail not, will raise as good a Soard in the first year, as after any Summer Corn whatsoever will in two, and must do well for these Reasons.

To lay down Land upon the Wheat, or Rye Stubble is best, and the reasons of it.

First, because it hath one half year more to Soard in, then after the Lenton Tylth, and so is somewhat Soarded before Oates, Barley or Pease are sown.

Secondly, because winter Corn groweth thin, long, and a stronger Straw, and gives more liberty to the grass to grow, and spread the thicker, and the Soard will also be very rich and fruitfull; I likewise advise to sow this Land, as early as possibly you can, even as soon as your other Crop is ended, the sooner the better, unless the Condition of the Country very much oppose it, how ever the Earlier it is

The way of
Sowing Land
to be left after
to Graze

sowed, the better is the Crop like to prove in my opinion; because these Graines of Wheat or Rie, &c. require the land to be in better Tillage than this can be: Therefore help it what you can possibly, by seasonable and early sowing, that it may have as much Summer as may be, and by all means Harrow in your Corn after it is Plowed; For this is more certain to produce a good Crop; And secondly leaves the Ground even smooth to Graze; yet forget not that your Land be left High, and Round, the Colder in nature the Higher and Rounder as aforesaid, & each Furrow be Scoured up as cleanly as you can possibly; These simple particulars really Observed, and Practised, will bring the Land to that condition that I shall make good what I formerly promised, and to this particular I shall say no more for present, onely this may be applied to any of this second sort of Land, be it of what Mixture, or Composition soever, that is Banky, Mossy, Cold and Rushy, and will have a proportionable effect promised; But if possibly you could run over

Dung laid up-
on the new
fresh Turf,
works wonder-
ders...

a good part of this Land with Dung after you have plowed it, before you sow your last Crop, or so much as you could, it would produce a double advantage of the cost bestowed towards the Soarding of it. And if after you have Reaped your last Crop, you could then run it over again, with any quantity of Muck, or Compost, it might so nourish your Land, and that for many years after, possibly it might be near as good again upon the old Soarding, as it was before; for you would wonder how much good one Load of Manure doth upon the Land so Tender, wrought, and Mixed, beyond what two or three Load will do on old Soard, or old Pasture so Rough and Filthy; nothing will make you to beleieve this, but your own experience. Let me prevail herein (good Reader) to make a tryall, it will be to thy benefit, be not an Enemy to Tillage, nor raising Corn to Poor, and Common-wealth, and if thou expect better Satisfaction, take it from divine evidence and from the Conclusion of him that spake by Inspiration, as well as from natural Experience.

When one
Load of Ma-
nure will go as
far as two or
three.

Prov. 12. 11.
Prov. 28. 10.

*He that tilleth his Land, shall be satisfied with Bread, and
shall have plenty.*

Muck

Chap. 16. *Reduement of Land to pristine Fertility.* 107

Much food in Tillage for the Poor. And if this satisfie not, Prov. 13. 23. carry this one Text (if thou canst remember no more) along with thee into thy Pastures, when thou art in thy greatest Glory;

He that withdraweth Corn, the people shall curse him, and a blessing upon his head that selleth it. But he must get it first, and so we ought upon that Land as will most freely yeeld it, which I conceive is a main end wherefore Thou and Thy Land was first created. Be not envious to thine own good, nor wilfull to thine own profit. I am much abashed to use so many words; to press so plain Simple Principles, thought to be well known to all (and possibly they may be, better than to my self) but truly the little Practise of them, and the Scorn men carry in their Breasts to learn, and that Thirstiness in me after the Common good, occasions all this Rudeness, to see thousands of Opportunities so neglected makes me amaze.

CHAP. XVI.

ANd first for your richest sorts of Land conceived as Rich for as good as Art and Nature can make them, yet consider the ensuing Discourse, may hold out some Improvement to be made out of the same. As for your best Land of all, That by Husbandry, Drayning, Separating, clearing, Plowing, Soyling or some sort of husbandry or other was brought to this perfection, it was not in this condition naturally nor originally from the beginning, much whereof may be now clear from Rushes, Mossiness, Sow Thistle, Nettles, Weeds, and Hemlocks and all other pelf, and onely bring forth pure Grass, both thick and rich; this possibly may admit of little Improvement upon it self, but unto the Owner and Common-wealth this may yeeld above double profit for some yeares by moderate Plowing, and afterward return so soon to his naturall fruitfulness, as that it shall yeeld his old Grazing Rent the first year, and so continue; But this Land being of all other the most subject to Abuse,

Destruction of
the best Land
is by over-
plowing.

Mowing Land
a great Impo-
verishing.

Moderate
Plowing better
than unlimi-
ted Mowing.

and greater prejudice than any other Land whatsoever; And I am confident unless the Presidented directions contained in the fourteenth and fifteenth Chapter, be most punctually observed, it may suffer loss, therefore I must provoke no man to take the pursuance of them here, unless any who is of such a publique spirit, as rather desires the Publique than his own private Advancement; And for some other men when they find so great profit come in upon them by this or any other means, they out of a thirsty desire of gain will Over-do, Over-plow, and so destroy their Land for it is not Plowing simply as aforesaid; that impoverisheth Land, but too oft Plowing, and look you where you will generally throughout this Nation, and you will find where any good Pasture is destroyed hereby, they have Plowed Six, Seven, and some Nine, Ten, and some Twelve Crops together, which I approve so well, as I say it is a Losing Extreme; And I wish it were Felony so to abuse a mans Self; Lands, Posterity, and Common-Wealth; Also which Lands may be so many yeares before they come to a perfect Soard again, as may lose as much in abatement of Rent before it come up to the old Rent, as they got in the advance Rent by Plowing. And yet if I affirm, that Mowing Land without Limitation, is as impoverishing unto it, as Plowing Land with Moderation, especially Upland Pasture, I should not much mistake; I am a greater Enemy to the one without Limit than to the other with Moderation, and yet the one is cryed down by all, and the other by few or none; Therefore my advise shall be, to Plow thy Land three, four, or five Crops, if thy affections stand that way, and lookest at greatest profit, Sowing it first with Hemp, Oad, Coal, or Rape-seed, Madger, Licorish, or Sow such rich Commodity that will so well pay for it, or something else that better agrees with the rankness of so gallant Land, which for divers of the first yeares will be so rank, that Corn will fall Flat, and Dwindle, or Rot, and neither be kindly in quality, nor rise to the strike in quantity, as it will upon those Lands after divers Crops taken, or upon leaner Land, and then after with Corn the last yeares; And if thou wilt

wilt but lay it down round, & even, upon the Wheat, Rye, or Messin Stubble Sowed in his proper Season, observing some other few Directions, handled more at large in the aforesayd Chapters, thou shalt not need to fear thy Lands Impoverishing or abating Rent; It will produce so gallant and sweet a Turf, as will feed as well, and faster than it did before, if not better: For my own part, I do affirm, That had I the managing it whilst under Tillage, I would make good the same upon good Security; But as I said before, use your own liberty, he that Plows not such Land at all that yeelds its utmost strength and fruit in Grazing, which admits of no Corruption or Degeneration, doth well: Because the Nation will afford other Land enough, that stands in more need of this Husbandry to supply the Country Corn; And also because many men hold it a great Disparagement to Plow up such gallant Pasture, from whom I do very little or nothing dissent in Judgement, yet he that (if by Plowing) can Advance the Publique and himself also, I dare not say but he doth better, yet neither much amiss; Every man herein may please his own affection, where the Common-wealth is not eminently prejudicd.

Plowing left
indifferent up-
on the Richest
Lands.

But for other wayes of Improvement of the Richest sort of Land, I know little more worth Divulging, for either the Cost and Charge expended will not produce an answerable present Advantage, or else the continuance and certainty of future hopes may prove doubtfull; Which uncertainties I affect not, onely take this remembrance with thee, that if thy Pasture be very Vast and Large, Lesser Divisions will ser the dearer and better, and every mans money for Convenience, when greater are bargains for few men, and those for great ones also that will make their own Advantage, yet use moderation herein also; A large Pasture is comely, and a little Pingle Inconvenient, Extremes are neither for Credit nor Profit, but for Destruction; A Pasture about one hundred or sixscore Acres, or a hundred and fifty Acres is very commendable where they lye remote and at good distance from great Market-Towns, or where Pasturing is ve-

Divisions of
Land advan-
ceth.

Small Divi-
sions reprov'd.

ry plentifull, but if either Pasture-Land be scarce, or border upon Common Fields, or Heaths, or Forrests, or if they lye near or adjoynning to any good Market, or great City, lesser divisions will farre out-vy with greater in their price & advantage, the people lying under such necessities of Pasturage, some to help to relieve their Common, and others to relieve the necessities of their own neighbouring Families; But in thy Divisions be sure to make them alwaies in the lowest parts of thy Lands, that so thy Ditches may serve in stead of Draines or Conveyances of Water, or taking away the Coldness that offends thy Land; every mans own Experience will patronize this Position.

But secondly, when any of these Rich Lands shall Degenerate into Mossiness, Rushes, Coldness, or Over-grow with Weeds, Nettles, Hemlocks, Sow-Thistles, &c. then thy Land will need good Husbandry, and will admit of Improvement, for Hemlocks, Nettles, Docks, Chick-weeds, and other common Weeds, these are as much occasioned with Fatness and too much Richness, as from any other cause; And when from this cause, no cure like Plowing, for that brings profit with the Cure, and advance in the very Reducement; there is much Land of this Fatness; Some there is in divers parts of this Nation, as about Hay-Stacks, or Sheep-Pens, or places of Shade, or in the Warmest parts of many Pastures, which Sheep and Cattell chuse alway for their Lieare, and very much about the heads of Conney-Berries; All which according to former Direction (in Plowing old Resty Land) will Reduce this to Moderation in over much Rankness; And especially if it be Plowed somewhat oftner than the other sorts of Lands, it will bear near as many more Crops without prejudice, and no other means whatsoever will so Surely, Feacibly, and Profitably, work this Effect in my Experience, viz. To destroy the Weeds, and reduce it to perfect Grazing.

And as your Land degenerates to Mossiness, Rushes, and Coldness, none will deny the wonderfull certain change and alteration thereof by Plowing, if they should, I conceive I have sufficiently cleared it where I have discoursed of the

Plowing the
only Cure of
VVeeds.

Plowing the
only Cure a-
gainst Mossi-
ness, Rush &
Coldness.

the second sort of Land at large in the thirteenth, fourteenth, and fifteenth Chapters, and answered severall Objections made against the same; yet one or two more remains to be Objected; Bear with me, I say the more herein, as Coveting to beguile men of such Prejudice as possesseth most, and so deeply rooted, as will ask hot water to Mattock up.

Some say they have found the contrary, their Land not Soarding of many years after, and when it hath come to Soard, it hath been neither so Rich, Thick, nor Fruitfull, & therefore Prejudiced by Plowing.

Object.

Against timely

Soarding.

All which I Eccho with thee that possibly it may be so, and yet this may not reach too, nor in the least weaken my Propositions, which give direction onely to three or four Crops at most, unless in case of Weeds and Nettles, and too much Fatnes, I never advise to Plow thy Land so long to bring it to this, I abominate such Husbandry, neither do I absolutely perswade to the Plowing of all Lands without Exception, well knowing that in some parts of this Nation, there are some Lands, so Binding, so Tough a Sodering Clay, & Cold, that it will neither Soard so thick nor quick as others will, which sort of Land if Rich, and Sweet, will less Advance by Plowing, than any other, but to this sort of Land as it doth degenerate and decay, use it as a Medicine, and use it as according to former Rules, and lay down thy Land according to former Limitations, & question not though it Soard not so soon as other Lands, Mixed Light, & more Loosened, yet it shal both Soard so Timely, & so Richly, as it shall counter-profit all thy prejudice. And for other Lands either Gravelly, Light, Warm, and Sandy, or else Mixed, and Compounded, I dare affirm some Land the first year may be full as good as it was before Plowing; I have known a Winter Stubble after the Crop was Inned of some Pastures, worth as much that Winter half year as it usually was worth any Winter upon the old Soard, & yet hath not bin Pastured the whole half year neither, nay some have been worth as much as the said Lands have bin worth almost the whole year. The Eadish hath bin

Ans. 2.

Plowing some Land must be used as a Medicine not as a Calling.

What Land it is that may Soard as well the first year to as much profit as before.

A President of Wheat stubble is speed, so Soarding.

so fruitfull, and my self have had the like Profits and Advantages, and have had a Wheat Stubble of my own being the third Crop, that will make good what I have Affirmed, and the very first year of Grazing full as good, if not better, than it was upon the old Turf before Plowing.

Object.

They that cannot manage this Objection further, yet confess and say, 'tis true for two or three of the first years it may possibly hold fruitfull, but it shall fall after seven, eight, or ten, or more years, after that it shall be worse than ever.

Ans.

To this I can say little more than what I have said before, unless you can produce me some Experiment, wherein my directions have been observed, and your Prejudice succeeded, otherwise you say nothing; which Experiment when you have found, I shall not question but to discover your mistake, either you are mistaken in the nature of the Land, or else in the manner or way of Husbandry and Plowing, or else in the Method I propose in the laying of it down to Graze, or else the Stubble you lay it down upon, in all which if you pursue me not, expect it not, all being facible, and any man may more certainly, and as I conceive more delightfully, work by Rule than Random. I say then in the ordinary course of nature, Gods blessing accompanying it, it shall increase and improve for many yeares, and continue untill some of the former and aforesaid Corruptions predominate again; Of which my self have had large Experiences, and can produce many Presidents, and do but you look into and upon much of your new laid-down-Land to Graze, which being continually Grazed doth put more proof into all sorts of Goods, breed better, feed faster, milketh fruitfuller, than old Pasture that is Richer, for ten, fifteen, or twenty yeares together. I have bought the purest Mutton out of Land the third, the fourth, or fifth year after Plowing, being about eighteen or twenty shillings per Acre, than any Land in those parts of near thirty shillings an Acre hath afforded, and in reason it must needs be so, because what Grass comes fresh, is pure without Mixture,

A president of
fattest Mutton
on the newest
Turf.

and

and sweet, being Young and tender, and having no corrupt Weeds or Filth to annoy it, and fruitfull, having heat and strength left in the Land to feed it, and for continuance fear it not, if Grazed, for the very Grazing will Inrich it every year, and Improve it untill it grow so old again, and ever-run with Moss, Ant-hills, Rushes, or other corruptions, that it requires Plowing; and then let it have it, for the Lands and thy Advantagesake; I know other Pastures which indeed were Plowed nine or ten Crops, and did much prejudice the Lands thereby, which I exceedingly condemn; yet this President answers this Objection, it lying now upon the fourteenth or fifteenth year after Plowing, is better than ever was since Plowing, and mends every year, and is rich and healthfull if not more than it ever was, and would far more have abounded in fruit, if Moderation had been used.

Another Objection may be raised, which is this, your new Plowed Lands are more subject to Rotting Sheep than your old Pasture.

Object.

I answer, usually it is so, and Experience hath proved the same; yet if you ever found any parcell of Land Husbandred according to these directions, nicely observed as aforesayd, that it was layd so high and round, his over-Furlongs Drained by the lower, and a good Master Ditch or Trench the lowest, and Plowed but three or four Crops, and laid down upon the Winter Corn Stubble, &c. you either found little danger in it for Rotting, or else no more than other Grazed Lands thereabouts was subject to, for in great Rot years indeed, many of your Cold, Sowr, Rushy Pastures, Rot themselves though never plowed, especially such as have either great Road-ways, Drifts, or Passages through them; yet observe these two directions following, put case it should Rot first or second year, then Stock it with Beasts, and that prevents it, or else secondly with part Sheep, those barren Sheep to feed, and not with a breeding Stock, and part Beasts, and very easie that you may have Grass at pleasure, to satisfie them to the full, which will probably prevent them from eating Dirt or Gravell, and this

Ans.
Rotting Sheep
in new Pastures
well ordered
may be rare.

To prevent
Rotting in
new Tilled
Pastures.

will turn thee out as much profit and secure that danger in great measure out of question.

Separations
and raising of
Quick-set
Hedges a great
advancement.

Hedge rows a
thing of de-
light and cre-
dit...

As for Rushes, Moss, and Coldness, which doth not much offend the best sort of Land, I refer thee backward to its more proper place, and have little more to say in the Advance of this richer sort of Land, but onely that in your Separations and divisions of your greatest Pastures, you be very curious in erecting Quick-set Hedges after the manner prescribed in the sixth Piece, and the three & twentieth Chapter; and be most carefull of preserving them from biting and treading, and well fenced from any Annoyance, & maintained with constant Weeding for two or three years together, all which exactly observed, you shall raise upon each Lordship or Pasture, Fuel and Fire-wood sufficient to maintain many Families, besides the Timber which may be raised in the Hedge-rows, if here and there in every Pearch be but planted an Ash, Oak, Elm, or Witchazell, all which will not onely be most profitable, but most delightful and honourable unto men of Ingenious spirits.

And if to this thou wouldst but add the sowing of Kernels, or planting Crab-tree Stocks here & there in all your Hedge-rows, and grafting of them, and preserving them precisely til they come to Trees, how gallantly would this good Land nourish them? what a benefit might the fruit of these Trees yeeld either in Perry or Sider, to be transported into other parts, or else to relieve our poor at home? of which were there plenty this dear year, one third-part of the Mault of this Nation might be saved, and so that Barley be for Bread; But more of this in his proper place, which I shall present thee with, as an admirable Piece of Improvement of it self upon any Lands it is capable to be made, as a new Addition in Orcharding Improvements.

Reasons why
Quick-setting
thrives no
better...

Here two or three words more to shew the great Prejudice men suffer for want of these Plantations when they make divisions or separations in their Lands by new Quick-setting it.

When men have planted the Quick, they conceive then they have don, nor observing perhaps neither to plant it in the...

the Over-most and Fattest Earth, nor for to Root all their Sets in the best Mould, nor when they have done, to preserve it from Sheep and Cattell, nor Mould it, Weed it, Hedge it, and secure it as it shall stand in need, for three, four, or five of the first yeares, All which were it done upon all Opportunities, No man almost in the Nation would be either at want of Firing, or Timber, especially were all such Ffields, ^{Hedge rows a} Marshes, Heaths, and Commons thus separated and divided; ^{great help for} all which are fecible and might be done with great profit ^{Firing and} to all, and prejudice to none. I am ashamed to speak so ^{Timber.} much in these so easie and wel-known wayes of Husbandry, but that there is so much neglect thereof, as if men minded more their own and Publique Confusion, and Ruin, than Profit and Advancement; Some will cast Banks and Ditches for separation, and plant no Quick at all in them, and so destroy as much ground as if they Quick-set it, and spoyle the ground to no advantage; and others will Quick-set and never Fence it, Weed, nor Mould it, and so it either perisheth at first, or else groweth dwindled, lean, and barren, not worth any thing; or else suffer it to be bitten, or eaten with Cattell, or else stifled with cutting or plashing before it is ripe or ready, that it comes to no thickness, growth, or fruitfulness; In all which were there but a little Patience, and Addition of a little more cost and paines, there would not be one foot of ground more lost, but a double or treble Advantage raised upon it in few yeares, and ever after, with no other Husbandry continued, but ever bring in double profit for the charge bestowed. As in the cutting, plashing, scouring of the Hedges, which payes his cost bestowed, and sometimes double and treble, and if it be a Hedge curiously preserved, and cut just in his ripest season, before it begin to die ith bottom, and have in it either good store of great Wood, or Fruit-Trees planted among, the profits may arise to much more than is here spoken of.

Not preserving
Quick-sets
when planted
is ruin to good
Husbandry.

CHAP. XVII.

Wherein I proceed to a second sort of Land, somewhat Inferiour to the former, wherein is discoursed the destruction of the Rush, Flag, and Mare-blab, altering the Coldness of Nature, and the preventing the standing Winters Water, and destroying Ant and Mole-hills, &c. All which are most incident to this second sort of Land.



His which I call a second sort is our middle Land (I delight in plainness, and avoyd all Language darkning the plainest sense, or whatsoever may occasion mysteriousness, or confusion in the reading or practice) so that this middle sort of Lands, as aforesaid, is all such Lands that are betwixt the value of twenty shillings *per Acre*, and six shillings eight pence *per Acre*, which sort of Lands as they lye under a capacity of the greatest Improvement, I have handled them at large in the foregoing Discourse, especially under the four first Pieces of Improvement.

But as they lye under a Capacity of a moderate and less Improvement, fall here to be discouried; and although I call it a moderate Improvement, yet being well Husbandred, according to the subsequent directions, may produce a double increase, and some far more, and some less, but in all a considerable advantage, enough to encourage to the prosecution.

And possibly some of these Lands may be of the richest, and

and first sort naturally, but by some Improvidence or ill Husbandry being degenerate are saln under this second, and that where the Rush either hard or soft prevaileth, or else where the Land lyeth so flat, cold and moyst, that the Flag or Marc-blab thriveeth, I shall here onely apply one remedy for the removall of them all, to avoid Tedioufnes, which is most naturall thereto, and cannot fail being punctually observed, and that is a way all men use already, though to little purpose, which is to indeavour Drayning of the same; as you shall see in most mens Lands, both Pasture and Common, of Trenches as they can hold, to their great cost, and loss of abundance of good Land devoured in the Trenches, Heaps, and banks, they make, and yet all is of little use, the Rush as fruitfull, and the Land as cold as formerly in comparison. Therefore I shall advise far less Trenching, and yet produce more soundnes; I say then, as I have often said, seek out the lowest part of thy Land, and there make either a large Trench or good Ditch, or be it but the old-one well scoured up (if there be one) to such a Depth as may carry away that water or Corruption that feeds the Rush, or Flag, from every other upper Trench thou shalt see cause to make, and so ascend to any part of thy Land where these offences are, carrying with thee one Master Trench to receive all thy less Draines, along with thee, and there make a Drain (yea all thy Draines and Trenches) so deep (for I prescribe no certain depth) as to that Cold spewing water that lyeth at the bottom of the Rush, or Flag, which alway either lyeth in a Vein of Sand and Gravell mixed, or Gravell or Clay and stones mixed, as aforesaid, and thence will issue a little water, especially making thy Trench half a foot, or one Foot deeper, into which will soak the Rushes food, which being laid Dry and Drayned away cannot grow, but needs dye and wither.

It is impossible without going to the bottome to do any good; Our own experience shews it, and so the depth may be two Spades graft or more, however to the bottom thou must go, and then one Trench shall do as much good as twenty, alwaies curiously observing that thy Trenches

Usual wayes
to kill the
Rush Flag, or
Marc-blab.

Drayning the
most naturall
way.

Much Trenching
reproved.

How to find
the matter
that feed the
Rush & Flag.

run

run in the lowest part of thy Ground, and through the Coldest and most quealieft parts of thy Lands, and for the manner of making the same, and further Direction therein, I shall refer thee back unto the second Piece, the-seyenth Chapter, where I have spoken something to most of the a-fore said Passages.

How to drain
Land well
where there is
no end of
Trenching.

But if thy Land lyes upon a Flat or upon a Levell, and have many great wide Balks, of which there will be no end of Trenching or Drayning, I must then assure thee it is to little purpose, yet art not left remediless, for this insaing direction will not fail, and will bring profit with it to pay for curing also, which is a moderate Plowing, Ridging all thy Balks, raising and Landing all thy Flats, gaining them as high as possibly thou canst, Plow all, and leave none, and do this three yeares together, and observe such former Directions as are contained in the thirteenth, fourteenth, and fifteenth Chapters in the third Piece of Improvement; And by the blessing of God expect the issue promised, It will lay Land sound and dry, more warm and healthfull than formerly, destroy the Rush, and many other Annoyances beyond Expectation.

I have been forced to be more large, & to speak twice to one thing, because of the suitableness thereof unto these Lands, but especially because I cannot speak enough to make some to understand it, nor others to set upon the Practice, and more especially because the Reader may miss the reading of it in the former part, unless he take the paines as few do deliberately to read the whole; Therefore if thou wilt forgive this fault, I'll mend the next.

As for the Mole-hills, so great an Enemy to the Husbandman, and Grazer, there is so much Experience made for their Destruction, that almost every Ingenuous man is grown a Moal-catcher in many parts, and that is a certain way, & yet in many parts men are Slothful, that because all thy Neighbours will not kil them, therefore they will not, so they suffer their Land one third part to be turned up; There is a Law to compell men to Ring their Swine, to prevent their Rooting, it were more advantage to the Co-

The causes of
Moals increa-
sing.

men

mon-Weal, a severe Law were made to Compell all men to keep the Moal from Rooting; for he destroyes abundance of Grasse he covers with the Mould, and Corn he throws up by the Rood, which utterly perissheth, Spoyle the Mōwers work and Tools, and raiseth Balke in Meads, and Pastures, besides the work he makes the Husbandman to spread some of them, the Cost whereof, were it but bestowed in Moal-killing, would prevent the aforesaid losse. And although I can make no new Addition to the Moales Destruction, there being so many Artists with the Moal-staff, in Moal De-Tines, and Traps of severall Sorts, of all which I commend the Pot-trap set in a Bank, or Hedg-sow, which wisely Set and Planted at all times, but especially in the naturall Season of Bucking time about *March*, will destroy them insensibly; Onely one thing more punctually observed in the time of breeding, will make such a Rout among them, which thy self or any ingenuous man may do, as is not credible; one Spring at or about *March*, one Moal-catcher and his boy, in about ten dayes time in a ground of ninety Acres being just laid down from Tillage, took me as was verily conceived three bushell of old and young, they were not to be numbered most of them being young and naked, and this he onely did by casting up their nests, which are alwaies built in a great heap of a double bigness to the rest, most easily discerned, and then immediatly the old ones would come to look their young which he would snap up presently also. them. Yet I desire to speak a word by way of Incouragement to the Ingenuous Husbandman not to suffer so great Dishonour to Husbandry, nor so great Prejudice to his Profit, as to suffer (were it possible) one to remain either in Tillage, Mead, or Pasture, and if thou have any Opportunity of Water to be brought over any part of thy Land, it will drive them out and destroy them so far as thou canst lead it after them, that thou needest not be in any measure troubled with them in thy Meadows.

VVant of a Law for killing of Moales a great mischi ef

Pot-Trap chief Engine in Moal Destruction.

Destroying the nests destroyes multitudes of

VVater best to destroy Moals.

CHAP. XVIII.

*And for the Ant-hills, more pestilent and
Offensive than the former, in some
Sorts of Lands.*

Ant-hills De-
structive.



Here is but a little Addition that I can make to what I spake before of Ant-hills destruction. But to quicken thee thereto, I shall be more large, being this is the most proper place: I demand what is the reason that infinite green Pastures all over the Nation are so over-run with them? Unless thou Account them Vertuous: Indeed some have said, they Increase the Land's quantity, & so they may say with shame, for so they do, but apparently Decrease it in quality, Worth, & Fruitfulness, half some mens Land covered over with them, and what is the fruit of them? They bear plenty of wild Time, Mouse-ear, Phins, Moss, and Shag-grass, you shall seldom see a Sheep or Beast bite them, unless for hunger, and then if a Sheep or Beast be cast among them, many times destroyed by them. I would have these men as are so far in love with them, but he is intrated to spend a little time to see how his cattell Pasture upon them in the winter, and how they burn and scorch in Summer, & but make Experience of three or four Acres banking & the fruit thereof, & never conclude a demonstration by Opinion when experience may so easily resolve the question. For Curing of them, I shall onely direct the old Piece of banking them, but in a more unuall way, and somewhat more speedily than formerly, yet make a banking Iron or Spade, made very thin or smooth on purpose, a little more compass or curving than your ordinary Spades are, & deeper bitted also. A Spade that worketh smooth & clean will further this doubly, and then begin with the crown or top of thy Hills, and so divide thy over Turf into five or six parts, and take down the coat or over-turf to

Objⁿ.

Ans.

Ant-Hills good
to destroy
Sheep or
Beasts.

How to bank
Ant Hills most
speedily.

Chap. 18. *Reduement of Land to pristine Fertility* 121

the very bottom of it, the Turf being cut as thinne as possibly thou canst, so thou be sure to go under the Roots of the Grasse, else it will not Soard so thick nor speedily, and so turn it down round about the Coar, which taken out, and cast about thy Land so deep, that when thy Turf is turned down, even just as thou tookest it up, even so lay it down every Turf in its place, that the whole compass of the Hill may be rather lower than the Surface of the Ground, and but a very little neither, yet lower it must be, because else the Ant will return more readily again: And secondly, because then it will receive more naturally the Water, or Moysture, which will occasion a more speedy Soarding, and prevent the Pismires return, for the Moysture will not be endured by the old Inhabitants: And this done in the proper season, which is in the end of *November*, *December*, *January*, and beginning of *February*, which seasons if thou fail as good neglect them wholly; for thy Earth will neither have benefit of the Frost to mould it; whereby it will be spread with ease, and have some of the Winters rain to settle it into the Ground, nor the Turf have sitting time to sodder and work together before the dry weather comes to parch it; and loosen it again; and so maist lose a great part of that Summers profit which otherwise thou maist receive; And if thy Land be clean and free from Moiss, Rush, and other pelf, this will be a sufficient cure as to reducing the Hilliness to Plainness; and thy Land to an exceeding good Improvement; and so herein I have no more to say, unless thy Land be over-run with the aforesaid filth; but what is the Burden of my Song, and is the onely and sure Cure of most of the Maladies that occasioneth Barrenness, which is prescribed as a soveraign Remedy (*viz.*) Plowing according to former directions destroyes them all, & brings meat in the mouth with it, takes away the Fins, and the Mouf-eare, the wild Time, and Shar-grass, if used with Moderation, and so I have done with this.

As for the Sow-Thistle, the chief and onely Annoyance of all Thistles (as for other Thistles I scarce know how to

Why to lay them lower than the Surface of the Earth.

Sow-thistle a great annoy-
ance.

Easiest way to
destroy the
Sow-thistle

rank them amongst those grand Corrupters, because the opinion of most men are, that they are most certain symptomes of good Land; as usually they are; so are Nettles, Hemlocks, Mallows, &c.) and yet I had rather they were all destroyed than remain upon my Lands (but because they are of less offence, and we have greater Prejudices than these, I'll let them pass) but for the Sow-thistle, it is of so great offence that it destroys all the Grass it covers, which is many times a foot round, and also so easie to be destroyed, that I shall put the Grazier or Farmer upon no other charge or trouble, but onely take a little Paddle-staff, as a walking-staff, and give each one a chop at the Root as he passeth by them, which will be rather a Recreation to an active man than a burthen, and thus every day a few as they grow in bigness, will in few dayes destroy them all; Or else a Shepherd, or Keeper of the ground, as he walks among his Cattell may easily keep them under, as he goes about his daily business; But since I have found out a more certain way which will destroy them at once spudding up, which being done as soon as the Thistle begins to spread, but they must be done as it were up, by, or under the Root, which lyeth very overly, and if it be not cut at first chop, it may at next by the Root: I had the last year a Field of an hundred Acres so thick over-runne, that some Acres were as thick that one man could not do above half an Acre in a day, I caused them to be spudded up by the Root, which was done at two chops with my Spade, I was not only freed of them the last Summer wholly; but my whole ground is cleansed of them for this year, and so I hope for ever. I believe the charge thereof was near twenty shillings, or thereabout. A more certain way I know not.

Goose Tansey

For Goose Tansey or Hoar Tansey like Weed, I must needs make Proclamation, That he that can tell the destruction of it, shall do a very acceptable service; and for my self, I should be very thankfull for the Communication thereof, for I can say no more but this, Never Plow your Land too long, nor out of heart or strength by no means, for this occasioneth it to grow more thick and fruitfully;
and

and also load your Land hard with Cattell in the Springs, and when it doth grow high and strong, Mow it down about the end of Midsummer Moon, or in the dryest and hottest time of the Summer, but the earlier the better, and other means I can prescribe none other, but in all your Plowings foyl it well with good Dung, and lay it down rich, and full of spirit. I hope some man of Experience herein will help me.

For the destruction of Fearn, I shall prescribe such poor means that thou wilt take offence thereat, yet however, ^{Fearn how to} Experience having proved the truth hereof, I will prescribe ^{destroy.} it, viz.

In the Spring, so soon as it begins to grow up a little above the Grass, while it is young and tender, take a crooked Pole, or piece of Wood about six foot long, and let it crouch at one end like a Bow, or come like a Sithe, with which thou mayst strike off all the heads of the Fearn, as low as thou canst to the very ground, if thou please to make it with a little Edge thou mayst, but it will do without; And this course thou must take the second time also, as soon as it begins to sprout and grow up again, which may be within three Weeks after the first; And thus having bruised, and broken, and cut off the head the second time, thou shalt see such a destruction wrought, as thou wilt admire, the Reason I cannot possibly conceive o'her than this; This breaking, cutting, or bruising of the Stalk doth give a kind of Check or Comptroul unto the Sap which is ascending, that it ^{The reason of} causeth it again to recoyl into the Root, and so suffocates ^{Fearns dying.} and choaketh the life and spirit of it, that it descends downward and dyeth in the Earth; This I am from a very Ingenious knowing Husband informed, which not onely destroys it the present year, but for the time to come also, who hath made a more large and full experience of the same than my self hath done; But I believe if it prove a very wet Summer, thou must not wholly expect the destruction of it. But in some parts of the Nation where Fuell is very scarce, it will be thought to be Prejudice by many to destroy it, especially upon Commons where they reserve it for Fuell.

on purpose, and is a very great help to poor for Firing; yet whether in those very places it be so good as an Acre of Grass I question, but there are other parts where it is little worth, & some places not worth getting, yet it is the ruin and destruction of all the Grass it groweth over, for whose sakes I have spoke thus much, and am sure in most parts it is a most pestilent weed.

CHAP. XIX.

Treates of the destruction of Goss, Broom, Brakes, &c. and how to Improve ordinary Lands by Planting Fruit; and shews how to preserve Corn from Blasting, and from Crows and Vermine, and gives a Description of the Water Persian Wheel.



Easiest way to
destroy
Broom.

AS for your Goss, Broom, Braking, &c. which in some places where Fuell is very scarce, and the ground very bad, to prescribe a Cure is little Advantage: but where either Land is good, or matured Land, or Broom and Goss of little value; or else where men desire to Improve their Land to the utmost worth it can be raised to, it would be worth entertainment: But to give a perfect Cure thereof without considerable Cost bestowed upon it I know none; The best means for that, is to cut it in the hottest and dryest time of Summer, when the Sap is drawn clean forth of the Root, and many times this will destroy it.

But if thou wilt be a good Improver thou mayst destroy it utterly, and treble the value of thy land in the doing of the same, which is this.

When thou hast cut thy Broom, thy Goss, Ling, or Braking

Braking, it matters not at what season ; Then Plow thy Land, and make a Fallow, if it thou please ; or otherwise, take as many Crops as thou pleasest, more or fewer, all is one to this purpose, so as thou be sure to Plow thy Roots up clean, and then Manure thy Land with what Compost thou canst get, for I believe if thy Land be made Rich and fruitfull with any sort of Soyl whatsoever, it will in a great measure mend it; But without doubt if thou either Mar it well, or chalk it very well, and afterward Muck it very well, to mollifie, and looser, and open the Earth; or Lime it well, or Mud it well, and afterward Muck it over with good Cow or Horse Dung, or any other good Soyl, as House or street Muck, it will not only Improve it, but destroy any of these offences, or any other whatsoever that naturally ariseth from Barrenness or Coldness; possibly once Manuring may not do it, nor indeed canst thou expect so great an Improvement with so little cost; because I reckon not that any charge or cost thou expendest whilst thou hast it under Tillage, for that brings in thy charge again in thy Crop, & so not to be put upon this Account, but that which thou bestowest upon thy last Crop, for the last Crop I would advise thee to Manure to purpose, and so soon as thy Crop is got Manure it again, for it will also bring in thy charge in the Crop of Grass also; and again, whilst thy Land is young and tender, for at this season will one load of Soyl do as much as two when thy Soard begins to grow Tough; yea as much as three, when it grows Mossy, Rushy, Filthy.

Excellentest way to destroy Broom, Goss, Ling, and Braking.

When one load of Soyl doth as much good as two or three.

This is a most certain Conclusion which I have ever maintained, and proved by Practice, Ever to lay on Soyl that first Winte after Corning, and none good Seyling have raised an excellent sweet Soard the very first year, full as good again as it was before upon the old Soard: And this gallant Advancing-way shall certainly destroy both Bryars, Braking, Fearn, (Geo.-Tansie also if anything will do it) Goss-Ling-Heath, or any thing else whatsoever occasioneth Unfruitfulness, and work an Improvement above what is Expected. This way of destroying Broom, Goss, Braking.

An unfailling way of destroying any thing.

ing, or any such filth, would be of great esteem, had it been held out of it self under specious pretences of rare discovery as some can do, but I am confident it is an unfailling remedy, and will certainly destroy the pelf as it enriches the Lands, and though many devices may be found out, or strong conceits raised to do the same, yet at present I know none so certain nor so profitable.

There is another opportunity of Improving almost any sort of Sound Land, of which I gave a touch in the last Chapter, Treating of the way of Improving the best sort of Lands, of which it is most capable,

Planting Fruit-trees in hedges is good husbandry.

That is, by Planting all sorts of Fruit-Trees in all your Divisions, and Hedge-rows, where they shall not Prejudice one foot of Land, and where they may grow as prosperously as in an Orchard, if you will but wisely manage them.

The Cost or Charge of this Improvement is as easie as any that can be made, if you will cast it into a Method:

Chief piece in Planting all fruits.

That is, when you make any Partition in your Lands, which I know you will not without a Quick-set Hedge, in which in every twenty yards you may Plant a Crab-Tree stock as well as a Thorn, onely in setting of it be carefull of Moulding it plentifully with the best Mould you can get, For that is the main Piece in Planting as I conceive: To lay a good Foundation in every thing, prepares for a good Superstruction; So that if the Root be Nourished from the Earth, the Root will feed both Bough and Branch more plentifully: Therefore though thy Land be naturally Barren, yet make that place all round about thy Stock a good compass, as good as thou canst, with good mellow Mould, and that which smelleth well in Digging is Fruitfull, containing the juyce of Vegetables already prepared.

Best Earth discovered.

The Tender Mellow Earth is between the two Extremes of Clay and Sand, and must needs be best: And thus having Planted thy Stock in good Earth, thy work is half done, if thou do but now and then renew the same, that is, almost at it were, take up thy Tree again, or else get well under the

the Roots, and so apply fresh Mould to them while they are Young and Tender: And this will cause it to Thrive without measure, and put forth a gallant Smooth Bark, which is ever a Sign of a Thriving Tree: So that be but a little careful in the choosing thy Graft, both for it self and the Fruit of it, and then after Grafting have but patience in preserving of it a few yeares, and here is all the Cost Required.

The Improvement may be wonderfull, if men would but Plant their Grounds as in many Countries they do, as in *Warcestshire, Hereford, and Gloucestershire*, and great part of the County of *Kent*, they use Every Hedge-row is full of Fruit, and some men plant whole Fields over, every thirty yards asunder, whereby they reap a Couple of Harvests; One of Grass or Hay, and another of Fruits.

How to reap
two Harvests.

O that I might but be a Remembrancer to this poor Nation, of the many opportunities of Honour, Wealth, and Glory, it is Capable of, and that I could but persuade its Natives to take hold thereof, and deliver the Earth of those advantages it is so big withall: Judge the rest by this One Poor Piece: Were all men but industrious herein, how might the very fruit that might be raised in this Nation almost relieve it in such a year of Scarcity as this is like to be? If it would not be bread to the Poor, as it might be in some measure, I am sure it would be Drink, and how much Barley would that preserve to Bread-Corn that is now turned to Mault? Yes, had this very year been but kindly, and a Plentifull Fruit-year, what a great help would it have been to *England*? And might not *England*, had it been but generally as Ingenuous as some Members of it are, we might have had twice as much Fruit as now we have.

But certainly we are afraid lest Plenty should be our Ruin, or else all men that Study so much to get Estates at second hand, Each from other, would rather strive to gain it at first hand Out of the Earth, the True mother, in whose Bowells is more Wealth than ever will be drawn forth, and enough to satisfy (whether theirs is or no I know not) I am sure all Ingenuous men desire it, that so they may be as
the

the Midwife to deliver the Earth of it Throws, it will send forth enough, if thou wilt but lay an Egge in the Sand of the Earth, 'twill bring it forth: Help the Birth, be the Man-Midwife (who is never in use but in greatest need) Need and Misery is likely to be greater than is expected; Yes, I fear than hath been of many yeares; If God work not above man, And man work not now with God, by all Prudentiall means whatsoever. And so much, and no more be said of Planting Fruit-trees at present, untill I have gained more Time therefore, and Experience therein.

And now I resolve to speak no more of any more wayes of Improvement here; but onely One word of Preserving that We have already, and 'tis but onely to Direct a word or two how to keep Corn from Blasting, and Seed from Vermine.

An unfailing
way to pre-
serve Corn
from Blasting.

For Blasting is one of a Kingdomes Curses, And therefore to Prescribenaturall; absolute, unfailing Remedies in all Places and at all Times, is beyond my skill, yet one Unfailing Remedy there is, as to the Removal of this, so it is the Removal of all Causes or Occasions of Barrenness whatever, And that is sinne, the Root that brings forth all: First brought forth the Curse, and ever since the fruit thereof. The onely Cure thereof is our Lord Jesus set upon the Pole, he must damn the Curse for us, and in us, and we by looking up to him, and our Application of himself to us, Mourning over him, and humbling our Soules before him, hereby must we be made sensible of the Removal hereof, by which, and by no other means it is Removable.

But the naturall Helps as usually are Applied, are the Soaking or Steeping Corn in thick fat water, or Limewater, or Urine or Brine, and the Mixing-Lime or Ashes with the Corn while Wet and Moyst, that so it may receive part of Smithon-Meal, finest of the Ashes or Lime upon it self, and cloath it self with it, so as it may fall cloathed all over to the Ear, and so be covered therewith: This hath been Highly Commended of late as a great Preservation of the Purity of the Corn, and in some parts of the Chiltern Country, now put into great use, so that instead of their U-

The most usu-
all naturall
help.

usual

suall way of changing their seed, which hath been an Old received Principle of great advantage, (and I verily believe is very good Husbandry) now they betake themselves hereto: Yet however, I would not Dehort but perswade men to the other also; Especially those that use to fetch their Seed out of Chiltern into other Parts or Countries of the Fieldon, who have found great Advantage by their Constant Change of Seed.

A good help
to preserve
Corn pure.

And this is a very good meanes for the preserving of the Corn from Fowl, or Vermine also, which Usually devour one part thereof before it can be covered, the Lime or Ashes sticking to the Corn, offends them so, that they will avoyd it, and though I say it enricheth not the Corn, or Land, no more than what that Substance of Lime or Ashes is, that cleaves unto it; Yet so much it doth, and is a help, and a very good Help to the bettering of it; Yet not such a Help as some men cry it up to be, as if it were as good as a Manuring, or Soyling, which usually men bestow upon their Land for Wheat; So as I would have no man Under-value the least Opportunity of Advantage any way; So I would not have any man deceive his Land, or himself, for herein consequently the Poor and Common-Weale are beguiled also.

To preserve
Corn from
Fowls and
Vermine.

There is one Poor Simple Piece of my own Experience I dare not but Communicate, for the Preserving Early, or Late Sowed Corn, or for preserving it when it begins to Corn in the Ear, from Crows, Rooks, or Jack Dawes, and this was yet never failible to me since I found it: 'Tis no more, but Kill a Crow or two with thy Gun if thou canst possibly upon the place, where this Vermine haunteth, if not, Kill one any where else, or if thou canst not get a Crow do but take any black Feather of Crow, Raven, Turkey, Pidgeon, or any other Fowl, but let them be as black as possibly they can; And then take into thy Field where they Annoy thee, and in the most Obvious, Plain, and Perspicuous places, make a great hole of two foot over, and about twenty Inches deep, which Hole must be slack round about the Edges with the longest feathers, and some of the shortest blaid in

An untailing
Prevention of
Crows
Rooks, or
Daws from
Corn.

the Bottom of the Hole; with some part of the Carkas if thou have a Crow, and that Turf that you dig out of the Hole, or else that Earth being laid round upon a heep, you may stick round with Feathers also; The Feathers of one Crow will dress two or three of these Holes; and about half a dozen or eight of these Holes, will serve for a Field of ten or twelve Acres; Which being done, and made on the highest Ground; observe the Creatures, whether they will fall in that Field or no; all the while those Feathers remain fresh, which may be will be a month, unless great store of Rain, or Weather beat them much, and then they must be Renewed once again, if thou seest need: And if they Annoy that place, or once fall thereabouts, I am much Deceived; I know they will not, you shall see as soon as ever you have made but one Hole, and they take notice of it, how great offence they take, if One Crow but discover it, there is work enough for him to call his Fellowsto behold the Wonder, he'll gather all the Crows thereabouts to behold the same, which they will View with such admiration, as will make you admire the Creatures astonishment. The Reason is, as I conceive, no more but an Affrightment, or Astonishment, by a New and unexpected Object, or else from that Antipathie they bear, or some misgiving, or fear of being Intrapped themselves, that possesseth them, that they dare not come near the same; Neither Gun-powder which many use to dress a Crow withall, nor constant Shooting of them, or Killing of them, shall not have the like effect, It clears all the Field of every one to thy hearts desire.

The Reason
of the Crows
offence taken.

I promised to give a more Full Description of the Persian-Wheel, or Water-Wheel to raise Water out the Stream that Drives it.

And for the more Clear understanding of the Description of it, Imagine thou stoodst just before the Face of the Wheel as it is Placed in the River, to View the same as the Water Drives it; but this is of a very Plain Wheel, and as I conceive a better and more Exact one may be Disccovered.

The height of the Wheel may be Betwixt fifteen foot

to

to thirty foot, or more if thou pleasest, according to the strength of thy Water, & the height thou desirest to raise it, made just like an ordinary Under-shoot Mill-Wheel.

The fuller
Description of
the Persian
Wheel.

2. The breadth of the Sole or Ring of the Wheel may be also according to thy pleasure, from fifteen Inches to thirty Inches broad, Ladleled as other Water-Wheels are.

3. The Buckets or Kans to take up thy Water, if thy Wheel be about fifteen foot high, may be Six in number, or Eight if thou please.

4. The Buckets to such a Wheel, just so long as the Wheel is broad: The Bucket is made with four boards nayled to a bottom-board: Two sides run upon a strait Line, which are those planted to the Ring of the wheel, and to the Ladle-board, and the other two run towards an Angle-taper, declining from twelve Inches in the But or bottom, to six Inches at the mouth one way; and from eight at the bottom to four Inches at the mouth the other way; the mouth is open alway.

5. The Buckets fill themselves in the bottom as the Wheel goes, and so lose some of the Water in coming up, & when they come almost to the Top, a Trough about three or four foot long is Planted, as it were, in the Ring of the Wheel near the Spoakes of it, and takes the rest of the Water as it delivers it out at the Top, which may be about half the Buckets first take up, out of which Cistern thou mayst either in Pumps, or Trenches lead thy Water, for Watering a House or Land as thou pleasest, up to that Levell; It matters not how slow thy Wheel goes, nor for any greater fall or height of Dam than will drive thy Wheel, which may be about two foot; It is of very speciall use; So hast thou as Plain a Description as I can give thee, untill thou have the Figure or Form Delineated, which will give more light to the Discovery of it, which shall among other Tooles be Described, with a further Addition of more ease and Excellencies in it, than is here Described, if God give an Opportunity.

The Fifth Piece is a discovery of such Simples and Ingredients, to be compounded with the Earth, with the Nature, and use of them, In Application whereof makes good the Improvement promised, and Meliorateth the Earth to all Intents and Purposes.

CHAP. XX

Sheweth how in Tillage of thy Land, thou mayst improve it best, with an Addition of an Soyl, or Manure by farre, than upon the Turf in Grazing, and in particular Treateth of Liming

Improvement
of Up-Land
severall waies.



All Up-Lands whatsoever, especially all sound and wholesome Land, will admit of severall wayes of Improvement, as,

In generall all coarſe barren Heaths, Lingy, Broomy Lands, be it of lowest and meanest value is suitable for Improvement, by Liming, and by all the Subsequent Compositions; All old Resty Land, that hath not been Tilled of late, although it be coarſe of it own nature, and yeeld little Fruit, yet by Plowing according to former directions, all Advantages observed for three or four

four Crops, which I fear not but the heart and strength whereof will bear it out, without Prejudice; I have known Six or Seven Crops taken, of Land not worth above five shillings or six shillings an Acre, and it very little the worse, as generally all the Wood-Lands are apt to run to Moss, and Fearn, Goss, and Broom, and to be so extremely over-run therewith, that it bears nothing else, and if they be not tilled according to that ancient Principle all Husbandmen retain, every ten, or fifteen yeares, they will run into these Extremes so far; as that they will be of little use, so all other Lands of a better nature subject to these Extremes, no better way can possibly be than Moderate Tillage, according to the former rules prescribed.

President of
Plowing
Wood-Land
Land.

A Husband-
mans old prin-
ciple Wood-
Land Lands
Tilled every
ten yeares, yea
some every
eight.

And in thy Tillage are these special Opportunities to Improve it, either by Liming, Marling, Sanding, Earthing, Mudding, Snayl-codding, Mucking, Chalking, Pidgeon-Dung, Hens-Dung, Hogs-Dung, or by any other means, as some by Rags, some by coarse Wool, by Pitch Markes, and Tarry Stuff, any Oyle Stuff, Salt, and many things more, yea indeed any thing almost that hath any Liquidness, Foulness, Saltness, or good Moisture in it, is very naturall Inrichment to almost any sort of Land, all which as to all sorts of Land, they are of an exceeding Mellorating nature, and of these more particularly.

Means or Ma-
terials to in-
rich Land.

And first for Liming, it is of most excellent use, yea so great, that whole Countries and many Counties that were naturally as Barren as any in this Nation, & had formerly (within less than half an Age) supply with Corn out of the Fledon Corn-Country, and now is and long hath been ready to supply them, and doth and hath brought their Land into such a Posture, for bearing all sorts of Corn, that upon Land not worth above one or two shillings an Acre, they will raise (well Husbanded with Lime) as good Wheat, Barley, and White and Gray Pease, as *England* yields, yea they will take a parcell of Land from off a Lingy Heath or Common, not worth the having, nay many will not have it to Husbandry it, and will raise most gallant Corn, that naturally is so Barren, worth five or six pound an Acre.

Liming of
Land.

Liming of
Land.

And.

Ans.

And though some object it is good for the Father, but bad for the Son.

I answer, so are all Extremes whatsoever, that is, to Plow it after Liming so long as is either any spirit left in the Lime, or heart in the Land, or it will bear any sort of Corn or Grain, it will ruin it for Posterity; But if that after Liming, men would but study Moderation to their Tillage, and not (because the Land yeelds such abundance of Corn) Plow or Till it so long as it will carry Corn, no nor so long as it will carry good Corn; But if men would after good Liming, take three, four, or five Crops, and then lay down their Lands to Graze, it would not be the least prejudice; or if upon the laying of it down, men would but indifferently Manure it, or else upon the last Crop you intend to Sow, Dung it well before Sowing, and lay it down upon the Rye, or Wheat Stubble, it would produce a sweet Turf, and I am confident prove excellent Pasture, as good again as it was before; but if after it is layd down you would Manure it once again, a little Manure now will produce more fruit than as much more upon the old Soard, it would be warrished for ever; Many men have had ten Crops of gallant Corn after one substantiall Liming, some more, upon very reasonable Land of about six shillings eight pence an Acre, some Land worth a little more, but more Land less worth, and some upon Land not worth above one or two shillings an Acre, have got many gallant Crops upon a Liming as aforesaid; some men have had and received so much profit upon their Lands upon once Liming, as hath payd the purchase of their Lands: I my self had great Advance thereby, yet I lived twenty miles from Lime, and fetched it so far by Wagon to lay upon my Lands, and so not capable to make like Advantage as other Borderers. The Land naturall and suitable for Lime, is your light and sandy Land, and mixed sound Earth, so also is your Gravell, but not so good, and your wet and cold Gravell is the worst, except your cold hungry Clay, which is worst of all, but all mixed Lands whatever are very good.

Presidents for
Liming.

The Land most
naturall for
Lime.

As for your Lime it is not of a hot burning nature as most men

Chap. 20: Reducement of Land to pristine Fertility.

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men conceive, and do strongly believe, and many have wrote; 'tistrue it is of a wasting, burning, and consuming nature, before or in the slackning or melting of it; and may be possibly in the meal or spirit of it; but in the use of it, and working it into and with the Land and Earth, and in the production of the fruit, it seems & appears to be Coldest, and most sadning of Land of any Soyl whatsoever, and that for these Reasons.

The nature of Lime quite contrary to the common opinion.

1. Because of it self it is a heavy and weighty substance, and sinkes deep, and loseth it self sooner than any Soyl whatsoever; if you be not very careful in the keeping of it up, and raising of it, you will lose it before you are aware of it or can suspect it.

2. Because it so alters your lightest Ry Land, that though it be naturally Sandy and Gravelly, that it never before would bear any thing but Ry or Oates, yet by one good Liming it will be reduced to bear as good Lammes or Red straw Wheat, with Barley and Pease, as your strong clay Land.

3. Were it of so hot a nature, then it would have the best operation upon your coldest & wettest spewing Land, upon which it hath none, and all Experience shews the contrary.

How much will Lime an Acre.

As I remember, about twelve or fourteen quarters of Lime will very well Lime an Acre. you may also over-Lime it, as well as under-Lime it; Also a mixture of Lime, Manure, and Soyl together, is very excellent, especially for a few Crops, and so lay down to Graze I conceive is best; but by any means Till not long, for I say it is possible the Land may yeeld Corn being so exceedingly in Tillage, and so well wrought, as long almost as any Earth is left in it. I have seen many parts Tilled so long as there hath been little left but small Stones, Flints and Pebles; A *mad Customs*, fly from it, your Lime will sink downwards exceedingly, use all means possible to keep it as much aloft as you can, else you lose it, and the benefit of it, and remember it, whatever you forget, and then you may plow and work your Land, as you do with any other Soyl.

CHAP. XXI.

*Sheweth the nature, use, and benefit of Marl,
and giveth a President of the Improve-
ment made by it.*

Marl.



Marl is also a very gallant thing, I can say much for it, far more than I resolve to speak to, because others have spoken much thereof, though little to my especiall purposes; It is commended of all men, and very highly almost by every Writer, that sayes any thing in point of Husbandry; therefore I'll say but little, onely acquaint you with its nature, and an experiment made of it; and the severall Lands it is most natural for Advancement or Melioration to a little quicken the Practise where it is found, and the Search for it where it is not yet discovered.

Name of
Marl.Signs of good
Marl descri-
bed.

And for the nature of it, it is also of a colder nature, because it saddens the Land exceedingly, and very heavy it is, and will go downwards also, but being so much of substance cannot easily bury so soon as Lime will, and the description of it is not so much in Colour (as some say) as in the Purity, & uncompoundedness of it, for in my Opinion be the Colour what it will, if it be pure of it self that it will break into bits like a Die, or but smooth like Lead, without any Composition of Sand or Gravel; & some others of it if it will slack like Slate-stones, and then if it will purely slack after a shower of Rain, question not the fruitfulness of it. 'Tis possible some Countries may yeeld severall Colours of Marl, as it is affirmed of *Kent*; wherein is found both Yellow, Gray, Blew, and Red, and the red is said to be the worst there, which I will not here dispute, because it never fell under mine own Experience in that Country; yet I will say it holds not every where, indeed the Blew and Gray are very Excellent, and so also is the Red no less; And whereas the

the common sign is said to be Slipperiness, or Greasiness, in which I will not contest, but onely I say there is some as good Marl as is most this day in England, which is not so, but as it lyeth in the Mine is pure, dry, short, & if you water it, you shal find it in slipperiness differ little from common Claves; The onely sign, but the purest and truest sign as aforesaid, is the incompoundness of it, and if it slack also immediately after a shower, and shortly after turn to dust after it is thoroughly dry again, and doth not congeal and conglutinate like to tough Clay, but dissolve, fear not the Operation. Adventure the Experimenting of it, the fruit will be answerable to thy hopes.

And now give me leave to tel thee a true relation of one Experiment of my own (because I speak but little but my own Experiences) upon an hard Inclosed Wood-land Farm I rented, having some Land also in Common, amongst the rest I had about fifteen or sixteen little short Lands, or Butts, lay all together in the Common Field. All which said Lands were so gravelly of nature, that there was but about two Inches thickness of Earth before you came to as perfect Gravel as any High-way, yea so exceeding herein, that in many places turned to Sinder (like that the Smith casts forth of his fire, as the corruption of his Iron, Fire, & Coales congealed) and also so hungry and barren of nature, that before I converted it to Tillage, little or nothing was made of it; And to Graze it was not worth above two shillings an Acre, and yet it was Resty and old Turf, & had lain long, may be ~~fifty~~ or twenty yeares; And resolving to make an Experiment I searched for Marl, & found it where none had ever ~~before~~ in mans memory, nor within many Miles of it, and in an old strong Clay Pool I conceived it lyed, the which Pool I was forced to cleanse, being full of Mud, that so I might make the better and greater fall of Marl at last, and my Marl was perfect Red, differing in nothing from Clay in colour, but in the breaking into bits and ends like Dies, not slippery, as was discernable from Clay.

And because I would make an undeceivable Experiment

Some Muck-
ed, some
Folded, some
Mar'ed.

One no cost
at all.

of it (which ever was my greatest Arrogancy) I carried forth that Mud also to my Land, and laid it upon two or three Lands, as thick again as men use to lay on Soyl or Dung; I also Mucked with the Cart two more exceeding well, and as I remember Fold-Mucked two more; Also I Marled three or four far thicker than I Mudded the others; And one Land I neither Mucked, Mudded, Foulded, or Marled, nor laid any cost upon it at all, yet Plowed them all alike, & brought them into good Tillage, and Sowed them as I remember with Wheat, and Rye mixed; & for the first year, I reaped very good Corn upon my Cart-mucked Land, and Fold-Mucked the best of all, the best upon my Mudded Land the next, and upon my Marled Land reasonable good, not so good as the aforesaid sorts yeilded (because Marl yeields not forth his utmost strength the first year) And upon that I laid nothing, I reaped nothing, not so much as Straw, although I gave it the same seed, and the same Tillage as the aforesaid Lands. Whereby you may perceive the goodness of the Land, which is bad enough indeed when it will bear no Corn at all, for very little Land in *England* that is old and Resty, and in good Tillage, but will bear some, either Oates or Tares.

A double Ex-
periment.

The next year I Sowed Barley upon all sorts of these Lands, and upon my Marled Land was most gallant Corn, and so was my Mudded Land, my Mucked Land was the worst by far, the Muck decaying, and upon that I Soyled not, I Sowed the second year with Oates, and reaped nothing again that year also; Then afterward I Marled that which before I had Mucked, and that which had not Soyl laid upon it, & brought forth nothing the two years before, which brought forth as gallant Corn as *England* yeilded; And after three or four Crops my Mud decayed also, and that I Marled again and had the same Fruit as aforesaid; and for my Marled Land that I kept in Tillage nine years; without any other addition of any Compost or Soyl at all, and had as goodly Corn as grew, and then I left the Land, & ever since with some small addition of Fold or Manure, as they do the rest of their Lands; that out-strips all the rest,

and

and is discernable from all the Lands to this day; herin observe how it saddens Land; this was Rye Land most naturally, but it turned to Wheat, Barley, and Pease; and as it is thus excellent for Corn, so it is also very fruitfull and enriching to Grasse-land, provided you take heed of Extremes, which most men are subject to run into, which is not to Till it forth of heart, for to Till it forth of heart is just as if you work an Ox off his legs, a Horse off his stomach, or a Man off his strength, and then put them all to work for Wagers with those that are in plight and strength; Try what service one of them will do you, not a third part of that service they did before; Nor twice or thrice to Marle together I hold not proper, but when you resolve to lay down your Land to Grasse, be sure at the last Crop you intend to take (which may be the fourth, fifth, or sixth after Marling) then Manure thy Land wel with Dung, which wil so open, lighten, and loosen thy Land (for the less binding, and the more light, loose, and open, the more fruitfull) that it will produce a gallant Glovery, and white Hunny-suckle Grasse; and Graze fruitfully; and then if as aforesaid, the first year after thou hast laid it down upon the Wheat or mixt Corn-stubble, thou wouldest run it over again with Dung, it would pay thee treble; I cannot forbear inculcating these two (because I see it is so little practised in any part of the Nation, and I know it to be so wonderfull Advantageous) untill thou pursue the practice of them; if possibly never lay down thy Land to Graze, but thus, Let not thy Gain or Profit of a good Crop or two hinder thee of ten fold more, and dishonour thy Land, Prejudice thy Posterity, & defame thy Husbandry.

Marl saddens Land exceedingly.

Extremes in Marling re-proved.

How to lay down Land to graze after Marling.

Oh that this gallant Principle of Improvement of all Lands to their utmost worth, was naturally planted in all mens Breasts, tis true to get Wealth and Riches is naturall enough, and both in our thirsting and eager pursuit hereof by many lawfull common wayes, and by more indirect & baser meanes, Eateth out the very hearts and bowels of many, but thus to indeavour to raise Wealth out of the Earth by ingenuity, to raise soyl out of one part of the Earth to

The Prime Principle in Husbandry.

enrich another, or out of the Seas, or any way else by a mean
& Low charge on poor workmens labour, depending upon
the Almighty for that blessing, is that I so highly magnify:
not having forgot the old Proverb of making honey of a
Dogs — so I believe any Land by cost & charge may be made
rich, and as rich as Land can be, but not counterpoise one
quarter of the charge on labour, which I neither affect nor
Indeavour to hold forth, but my resolutions are to perswade
all mens Estates or parts to drive on all Designs for the Co-
mon good, so to Plow all thy Lands, as to make thy Lands
Fittest and Richest to Graze, and then to Plow again, when
thy Land decayes in Grazing, & thy Plowing shall far out
profit thy Grazing, I am confident a man might so Husband
the matter, as neither of these should hinder each others
Fruitfulness, but both help on each others Advancement.

Land most
naturall for
Marl.

Now the Lands upon which Marl yeelds great increase,
is upon your higher Sandy Land mixed or Gravelly, any
found Land whatsoever though never so barren, to whom it
is as naturall, and nourishing as Bread to Mans nature, and
will do well upon any of these, though somewhat mixt
with Clay, but strong Clay in my opinion is most unsuta-
ble; But an exact tryall I never made thereof, therefore am
not Peremptory, and although many men are of opinion
that it can have little Operation upon Wet, Cold, Moyst
Land, I say so, if there be not a possibility to lay it sound,
and Wholesome, but that I believe thou mayst do most
Land by Plowing of it up and Raising of it, as high as thy
Land will bear it, & then a good Drain or master Furrow,
if it will serve; if not, a deeper Draying Trench will, for
Wet, and too much Cold, and Moysture offends all Corn
and Grass also wheresoever, as well as Marl, but thus done
Marl will yeeld great store of Corn upon this Land also out
of question, my own president was upon a very wet Land,
upon a most sharp gravel,

CHAP. XXII.

*Sheweth the usefulness of Sand and other
Soyles out of the Seas and Rivers,
Sands also are great*

Inrichments.



AS for Sands manure, I conceive it warm of nature, and yet that is not the cause of its Fruitfulness, for then would all Sands have the like Operation & vertue in them, but of our inland Sands especially these which are naturally the Surface of the Earth, or else lyeth by Mines in Hills, Of no worth & many other parts of the Nation, I conceive little Fruit- or use at all, fulness at all, however I challenge not Immunity herein from being deceived; I may be, for I have made no tryall at all therein, and therefore what it may do upon a contrary natured Land I know not, if any have found benefit I desire to learn it, for Reason hath sometime deceived me, and so may others, but Experience never shall.

But as for your Sands brought forth by the Violence of strong Land-floods, and cast up on Hills & Shelves in many Meadows and other places in them is Fruit and Vertue, and good. I question not but the Application of them, either to Corn or Graze, will produce much Fertility, especially being seasonably applied to such Lands as are most different from the nature of it self; for whatever causeth Barrenness, be sure to provide a Soyl that wil stand in constant opposition to it, and so though one wast another, and both are weakened, yet the Earth is thereby bettered, as here the Sand is dry and warm, and something inclining to Saltishness, the Land I conceive best for this Soyl, is moyst, and cold, and while Heat and Cold, Dry and Moyst, coniect together, the Earth steales from both, and is much Advantaged hereby.

For

For in all Soyles and sorts of Earth there is a Combustible and Incombustible Nature, each Wrestling with other, and the more you can occasion Quarrels and Contention by these, that is, the more you ad to that which is predominant, and so allay the distemper in the end, the more gaineth the Earth thereby; For I suppose there is a kind of contrarietie in Nature, it was ever so from the Fall, & ever will till all be swallowed up again in one.

Pest Sand of
all.

But there is another sort of Sand, and this is the richest of all, and that is your Sand upon the Sea Coasts, and in the Creeks thereof, which is very rich, yet in some parts it may be somwhat richer than others, as I conceive, for this Reason, because all Lands that be bordering upon the Sea Coasts might then be Improved by them, but in many, and most parts of the Nation the use of it is neglected, & I dare not have so uncharitable an opinion of my Nation, that they would neglect so great and facile an Advantage; In *Devonshire* upon those Coasts it is very rich, and upon the Coasts of *Cornwall* also, and upon all the Southern and Western Coasts as this is, if there were that fruitfulness as there is in most Sea Sands, and is as likely also to be in this, unless or untill men have made experience, and through experience thereof, I for my part shall be loath to have other opinion of it, but that it is of excellent fruitfulness, and so all *Wales*-ward borders, so rich, as that they carry it many miles on Horse back unto their Lands, and make such vast Improvements, as to raising Corn and Grass also, as is incredible: Now, were it on the Northern, Eastern, or Western Coasts, as rich as it is upon the Southern Coast, as it may be for any contrary experience I have had, I could not believe the people to be so Dronish as they are in some parts thereof, but that they would Drain out that Sweetness to their Lands, as would cost but little or nothing but their Labour; However, I must absolutely say, there must needs be great heart and fruitfulness in these Sands also, because the Richness of the Sands is from the fat or filth the Sea doth gather in by all Land-floods and Streames that bring it from the Lands, and also what the Tide fetches in daily

What causeth
so much rich-
ness in the Sea
Sands.

dayly from the Shores, and from that fat and brackish nature in it self, and from the Fish and other creatures, and thousands of other matters that putrifie in the Sea, all which the waters Casts to Shore, and purgeith forth of it self, and leaves in the Sands thereof, while it self is clear and pure.

And now being discoursing thereof, give me leave to let you know the vertue and excellency the Sea may yeeld, as from Sea-Weeds also, which *Cornwell* and *Devonshire*, and Fish, many other parts make great Improvement of for the Sowing and Manuring of their Land, and that to very great advantage also, and further toward the Inriching of the Land, as from Fish of any sort, which is so fruitfull for the Land, that in many parts of the world they Dung their Lands therewith, but here with us, it yeelding more Advantage for Food to the relief of mans nature than unto the Earth; I'll say no more, unless any Capacity fall in the dead of putrified Fish, which is no other use than to this purpose; A good Advantage might be made unto the Land thereof, as I said, before any Liquid Brackish-fat, Greasie-matter, and any thing that comes from, or is the fleshy matter of the creature, whether it be by Sea or Land, hath a secret operation in it to the Earths fruitfulness; Yea the very Urine of man is very excellent, and of all beasts very fruitfull, and very rich, & would be of more Accompt if men knew the worth of it: I have read of some that have done too strange things therewith to report, but most certainly 'tis worth labour to preserve it with most exactness.

There is yet another Opportunity, out of many of your great Rivers, and is from a Mud, or Sludg, that lyeth frequently in deep Rivers, which is very soft, full of Eyes and Wrinkles, and little Shells, which is very rich, yea so rich, that in some parts many men get gallant Livings onely by taking it up out of the Rivers and selling it again by the Load, One sort whereof they sell for one shilling two pence per Load, and another sort they sell for two shillings four pence a Load at the Rivers side, which men fetch twenty Miles an end for the Inriching of their Land for Corn and

Y

Grass;

The Seas
fruitfulness bySea Weeds
very good
foyl for Land.

Urine fruit ful.

The richness
of Snayl Cod.

Grass; One Load going as far as three Load of the best Horse or Cow-dung that can be made; They call it *Snayl-Cod*, and it hath in it many Snayles and Shells, which is conceived occasioneth the Fatness of it; The great Experience of this Piece, is made upon that part of the River *Thames*, which runs from *Oxford* and *Reading* down to *Brainford*, and if my information fail not (which I conceive I have from as good a hand, a Gentleman full of great Experiences in Husbandry Improvements; as hath not many Fellowes) The Lord *Cottingham* drawing part of the River through his Park at *Hanworth*, hath cut in the same River many Outlets or Ponds, somewhat deeper than the River, on purpose to receive the same, from out of which is usually taken up great store of Mud for the Advance of the Upper Lands, but whether this be that richest Snayl-Cod I cannot say, but beleive it is very good, but upwards as high as *Cole-Brask*, in that River it lyeth plentifully, all which not failing under mine own Experience, I can say little more unto for present, neither for the seasons of applying it unto the Land, nor the manner of working the Land to it I dare not prescribe.

Where the right Snayl is to be got. The chief River where'n this Mud lyeth comes from-ward *Oxbridge* by *Cole-brook*, and is not the *Thames* as I can yet discover, having made a Journey thither since I wrote the aforesaid discourse.

Mud in Rivers of great use.

Only hence I conclude, there may as well be the same opportunity in most Rivers of the Nation, which is a most unutterable Advantage; But I can say there is in most if not in all Rivers a very good Rich Mud, of great Fruitfulness, which were it more sought after would work on more Experiments, and produce Advantage unexpected, it costing nothing but labour getting, nor prejudiceth any, but profit to all, by clearing the Rivers, and great worth and vertue it must needs have in it, bring the Soyl of the Pastures, and Fields, common Streets, Wayes, Yards, and Dung-hills, all collected by the Flood, and drawn thither, where it concentrates into Shelves and Mines as I may so call it, and remains for ever as an undiscovered Advantage, where no use is made of it; but hereof more, if God give opportunity to the Author of Experimenting both this, and others of the same nature to the utmost Advancement of it otherwise, and in the mean while inquire it out thy self.

CHAP. XXIII.

*Treateth of the use, and nature of Chalk,
Mud of Pooles, Pidgeons and Swines
Dung, and other Soyles and Ma-
nures therein contained.*



AS for Chalk, Sir Francis Bacon affirms it to be of an over-heating nature to the Land, and is best for Cold & Moyst Land, but as it appears to me in *Hartfordshire*, and other parts thereabout, there are great Improvements to be made upon Barren, Gravelly, Flinty Lands, & it hath great Chalk. Fruitfulness in it, but not having saie under my own Experience I dare affirm little therein, onely advise any that have opportunity therein to be well resolved of the Fruitfulness of the said Chalk, or of the nature of the said Lands, for there is some Chalk, though not very much thereof; that is of so churlish a binding nature, that it will so foder and bind and hold the Water upon the top of the Earth so long till it destroy the Corn, nor work a sterility in the Earth, that neither Corn or Ground shall yeeld but little fruit; but there is a Chalk in thousand places of great fruitfulness for Improvement.

Bacon's Natural History, pag. 123.

And I also conceive that Chalk Earth and Manure, mixed together, makes an admirable, sure, and naturall fruitfull composition for almost any sort of Lands, and is a very Excellent Unfallible Remedy against Barrenness, and raiseth Corn in abundance, & enricheth it also for Grazing when you lay it down; many great Countries in this Nation are under this capacity.

Chalk mixed most certain,

Also the Mud of old standing Pooles, and Ditches, the Mud. shovelling of Streets and Yards, and Highwaies, the Overthwarths of Common Lanes, or of Commons near Hedges,

is very good both, of it self, and compounded with other Soyl, Manure, Mud, or Straw; And very much account made thereof in some Countries; nay more than this of Manure that is made of Horse or Cow, for some sorts of Land and some sorts of Corn, which I conceive is for Lands very Flinty, Stony, and Gravelly, or a little mixed with Clay amongst them; as also for Wheat and Barley it is very naturall and is of constant use and great esteem in *Hartfordshire, Essex, Sussex*, and divers other Countries thereabout, and also to great Advantage being put in Execution in most of the Counties in this Nation, if ingenuity was of as good esteem among us all, as is a base Out-landish fashion, for no sooner can that be brought into any part of the Country, but it will be dispersed presently into all the parts thereof; but such as these that are Advantage to all, and vastly profitable to the Practitioner & Common-wealth, are slighted and little practised.

Ingenuity not
of such esteem
as a base Out-
landish fashion.

Earth of a saltish nature is fruitfull, especially all such Earth covered Earth as lyes dry, covered with Hovells or Houses, of which with any house you make Salt-Peter; is rich for Land, and so is old stores or barn is rich. under any buildings.

Pidgeons and
Poultry dung
little less infe-
riour.

There are many other gallant Soyles or Manure, as your Pidgeons dung, a load whereof is more worth than twenty shillings in many parts, your Hens and Poultry Dung, that live of Corn, is very excellent, these being of a very hot, or warm and brackish nature are a very Excellent Soyl for a cold moist-natured Land, Two Load hereof will very richly Manure an Acre; so is all Dung, the more it is raised from Corn or richer matter, the richer it self is usually by far; as where Horses are highly Corned, the richer is the dung than those onely kept with Hay.

Horses well
corned make
best dung.

Swines dung
most excellent
soyl.

There is another sort of Soyl and that is Swines dung, by most men accounted the worst of all, nay not worth preserving, out of an old received Tradition taken up by most men, upon what ground I know not, and so generally disliked of almost every one, and therefore they will not Experiment it, and much an end no use at all is made thereof, possibly it came from *Scotland*, who knew they but the excellency

cellency thereof; they would love the flesh the better for the dungs sake.

- Which to me is very irrational, that an *English* man who loves Swines flesh so well, that more Account and use is made of all the parts of him, rather than of the Beef or Sheep, yea his very blood and guts are highly prized, & yet the Soyl of him so much undervalued.

The great account of swines dung.

This Dung is very rich for Corn, or Grass, or any Land, yea of such Accompt to many Ingenious Husband, that they prefer it above any ordinary Manure whatsoever, therefore they make their Hogs yards most compleat with an high pale, paved well with Pibble or Gravell in the botom, where they set their Troughs partly in, and some part without the Pale, into which they put their meat; but the most neatest Husbands indeed, Plant their Trough without their Pale or Hog-yard, all along by the side of it, and for every Hog they have a hole cut, the just Proportion of his head & Neck, and cannot get in his feet to soyl his meat, and out thence he eates his meat forth of the Trough very cleanly and sweet, they keep the Trough also very clean, they have their house for lodging by it self with dry straw alwayes for them to lye in, and their cornish Muskings they cast into the yard for that purpose, and all Garbidge, and all leaver, out of Gardens, and all Muskings forth of their Barns, and of their Courts, and Yards, and great store of straw or weeds, and Fearn, or any thing for the Swine to root amongst, to make all the Dung they can into the yard for raising dung; and here they keep their Swine the year round, never suffering them to go one day abroad, and here your dayry Husbands or Huswives, will feed them as fat as Pease, or Beanes, and are of opinion that they feed better, and Fatter, and with less meat, than when they are abroad with all their Grass they spoil; Which I did more than three quarters believe, but now know it to be true of my own knowledge. Some Hog-yards will yeeld you forty, fifty, some sixty, some eighty Load, and some more of Excellent Manure often or twelve Swine; which they value every Load worth about two shillings six pence

The usage of their swine and the making of the Hogyard

How to feed Swine, without any cornish meat.

a Load in their very yards, & prize it above any other; This is practised much about *Kingsmorton*, both in the Countie of *Worcester* and *Warwick*, and in many other parts, as in *Cheeshire*, *Staffordshire*, *Derbyshire*, also I beleve An Excellent Piece of husbandry; I speak Experimentally hereof, having made great Advantage my self hereby, and do far more prize it, than suffering Swine to run and course abroad, knowing that rest, quiet, and sleep, with drink, and lesser meat will sooner feed any creature than more meat with liberty to run and course about into harms and wash off what they get with their meat, with their vexing and running up and down, and do advise as thou valewest thy own advantage; some good dairies will make the soyl of their Hogyard produce them twenty or thirty pounds worth of profit in a year.

Rags.

As for Rags of all sorts there is good vertue in them, they are carried far and laid upon the Lands and have in them a warming Improving temper, one good Load will go as far as half a dozen or more of the best Cow Dung. Coarse Wooll, Nippings, and Tarry Pitchmarks, a little whereof will do an Acre of Land, there is great vertue in them. I beleve one Load herof will exceedingly well Manure half an Acre, Marrow-bones, or Fish-bones, Horn or shavings of Horn, or Broaths made of Beef, Meat or Fish, or any other thing whatsoever, that hath any Liquidness, Oyliness, or Fatness, have a wonderfull vertue in them, let all be precious to thee, and preserved, for every little adds too, and helps in the Common stock, and he that will not be faithfull in a little, will not be faithfull in a greater quantity, as is always seen by constant Experience.

VVoo's.

Marrowbone.

Beef Broath

Sheeps-Dung.

As for Sheep-Dung, Cow-dung, and Horse-Dung, such old ordinary Soyl; I intend to say little; in regard the Common use thereof, which hath extracted the vertue and excellency to the Common-wealths great advantage, onely thus much I shall say by way of advice and reproof from my own Experience.

1. By way of advic Prize them according to their worth: The Sheeps Dung is best, and a little hereof is of more strength

strength and heart than the others are, but whether it arise from the rich, and pure nature of the Dung, or from the warmth of the Sheeps bodies, I know not, but I conceive from both, because it warms the Land & makes it comfortable; And therefore in regard of the worth and excellency of Sheeps dung, and in regard of the great want of soyl, I'll discourse a little more at large of a very good way to raise easily great quantities of soyl, and that very good and excellent, by the help of one good flock of Sheep, and that in the winter too, when soulding is more neglected and of lesser use: though I proposed it in the first Edition, yet because I set not forth the way of raising it, I fear occasions the neglect of it. It is but to make a good large Seep-house for the housing of thy Sheep in Winter, the comfort it will be unto thy Sheep, will be double worth thy house charge, which may be Sheep-cribbed round about and in the middle too, to sother them in the nights, herein once a week, or twice according as thou desirest the quantity of muck to rise, or according to the goodness of it thou expectest, bring in severall Loades of Sands either out of the streets or wayes, or from a sand-pit or mine once or twice a week, and lay it three or four inches thick, this renew every week or more and let them sit on it two or three or four nights or more, and keep this with renewing as oft as thou pleasest, and what with their heat and warmth of their bodies and the fatness of their dung and urine, they will so corrupt or putrify the Sand, that it will turn to excellent rich soyl, and go very far upon thy Land, and be far more serviceable than thou canst conceive. This of great use in *Flanders* and other parts of the World. And for your Horse Dung that is held to be too hot, but I never sensibly discern any inconveniences therein, especially where it is seared, let it be but well Wroxed or Rotten, and I conceive it is one of the best compost of Land, and I am sure, if it be Soyl of Horses, or Stables where is much Corn given, it is more hearty and rich by far, than that where Horses live of Hay onely; And for Cow-Dung tis as wel known by all, both in nature and use, that I'll save further trouble.

How with
great ease to
saite rich
dung.

Horse Dungs
Excellency.

A great mistake
in letting soyl
be uncovered.

2. But by way of reproof of one Piece of Husbandry in the applying these three sorts of Dung to Land, I say, Men are mistaken in that they endeavour not all possible Expedition in laying their Dung upon their Land, when once they begin, and in spreading of it as soon as laid on, and Plowing of it into the Land as soon as spread, for if my Judgement fail not, they lose a great part of the Fruit, Sap, and Vertue thereof, that carry it forth into their Land about *Midsummer*, or in that heat of Summer, and spread it all over their Land; and so let it lye open to the Air and drying Winds, and parching Sun, and Showres, which coming hastily help to wash it off their Land, and thus lyeth for a month or six weeks before they Plough it into their Lands, all over the Field or County, and many places more, which besides the Raynes washing away, consider but the Winds drying, and the Sun and Parching, and Scorching of it, & Exhaling, and Drawing away the Spirit of it, & then tell me the Excellency of this Husbandry; to me it seems not rational, I submit to better Judgements, they that are of a contrary opinion, I desire them to shew me Reason, and inform me better; And til I know better I desire to be excused.

How to lose
none of the
least benefit in
mucking any
Land notwithstanding
Land-floods.

Some lose no
Land flood at
all.

And for their Sheeps Dung, as soon as ever one Land is fouled, let the Soyl be covered immediately, let the season or weather be what it will: Also in the Manuring your Green-Sward or Grass Land, do little in the Summer, but either in the latter end of it, after *September*, or else all Winter long is the proper season, when it may have rain to beat it into the ground, or Frost to wrot it and dissolve it; And though sudden showers will wash some away, which is far less upon Grass ground than Tillage, yet if thou have any Land both below or under that thou Manurest, thou needest not lose the least benefit, if thou please to turn it over, and let it float thy other Land, with that which the Land-flood otherwise would carry away; And this course some Ingenious Husband hold in all their Lands, What Rain or Land-floods fall in their overgrounds, they carry into the next below that, and float there, then what falls in that, with the rest of that which is a floating there they carry into the

next.

next, & so into the lowest, & so will not lose so much as the advantage of a common Ditch that carries the least Land-flood with it, but this falls in occasionally here, & therefore no more hereof.

Mault dust is exceeding Rich for Corn-land, and one load being sowed, as you do, or with your Corn, will goe as far as six load or more of good Dung.

Mans Urine is of great worth, this will fatten Land more than you are aware of, & it were not ill Husbandry to take all Opportunities to preserve it for thy Land. Of this somewhat is said before, therefore no more thereof, onely I have read of a good woman of *Kent*, that preserved it, & sprinkled her Meadow with it, which occasioned such fruitfulness (though at first a little yellowish) that some of her Neighbours went about to accuse her of Witchcraft.

Urine of man-kind usefull for Lands.

Ashes also have a secret vertue and operation, of what Ashes nature soever or sort, that are burned thoroughly to dust, but your Wood-ashes are best, & usefull for Soyl and Compost. Soot also hath a vertue of Fruitfulness for Field or Soot Garden as some affirm, but I conceive the most proper soyl for Gardens are your Sheep-dung, your Hen-muck, and Pidgeons-dung, with your well rotted Horse-muck, especially for cold Land; or else the rich Mould, or any good Manure that is grown to Mould, is as good and naturall as any of the aforesaid Soyles, provided you lay good store of it thereon; & so also I conceive it is best for your Orchards, or young Nurseries of Fruit Trees, but of neither Garden nor Orchards Advance is my design for present, and so no more of that, much may be hereafter.

Ouse, or a kind of fat Earth in Marsh Ditches, is of excellent use for stony, gravelly, flinty or chalky Lands; there is an Earth or Mud got upon the River *Ware* in *Hartfordshire* near *Walton* of very good use and advantage for soyl.

Stubble, or Straw.

Stubble of all sorts, and other Vegetables, the more in quantity, or Straw, or Hay, sowed upon the Land is very helpfull & of good use with every Husbandman, that I need say no more thereof.

Sir Francis Bacon is of opinion, that Salt mingled with Corn

Salts effect.

How much Liming Corn, or watering Corn advanceeth it.

Oyl the fruit thereof.

Leaves of Trees.

Fearn or Rushes will make soyl.

Corn hath a very good operation being sowed with the Corn, which possibly may, because brackishness is fruitfull to the Lane. Also that Chalk and Lime sowed with the Corn is very helpfull, & that steeping your Corn in fat Water, Lime-water, of Dung-hill Water, hath a wonderfull effect to work strange things. Of all which my self having not made full Experience: can find no more Advantage the Chalk or Lime in substance, or so much as is added of therein than just so much as is added to the Corn, either of the Soyl or Fatness of either of the Waters, and no more; For having made a thorough triall thereof, found no otherwise, nor nothing of that great Advantage promised; But let not me prejudice any Ingenious trialls of the same, others may find more, possibly I might miss in the manner of my application, search it out thoroughly I beseech you.

As for Oyl, I am confident it is of a very Inriching nature to Land or Corn, but whether the Cost required will be requited I leave to Experience, for I have not forgotten the Oyling-Corn Patentee, that great design to so little purpose; who drew so many Scholars after him, but I had the happiness to escape him and his Patent too, though some paid dear for it.

The Leave of Trees laid together, or cast into some Highway, or Water-flowe, or mingled with other Soyles, will make very good Compost also.

Also Fearn, or Rushes, Thistles, or any coarse straw, or Trash whatever, flung, or cast into the Fothering-yards, among your Cribs under your Cattell, will be both good Litter to lay your Cattell dry and warm, and will make very good soyl, as all good husbands know.

Some more particulars may be spoke too, and some further directions given, but I'll forbear Experiencing these, will work out more discoveries. So much for this Fifth Piece.

The Sixt Parcell or Pice, which is a new Erection, or Plantation of divers sorts of Wood, and Timber, in such a way as shall raise as much in twenty yeares growth, as usually and naturally groweth in forty or fiftie years, whereby the Draynes or Ruins of Wood in this Nation may be gallantly repaired, and severall Groves or Plumps of Trees may be Erected about any Manour, House, or Place, for delight and pleasure; And in such severall formes as men desire, and as much Wood for quantity raised in one Acre, as is usually in three, four, or five Acres of our usuall Copices, or Spring Woods in most parts of this Nation. As also how to thicken those Spring-woods that grow so thinne, as usually most doe, whereby they might be made as thick

again, and yet not hinder the growth thereof.

CHAP. XXIV.

Speakes of the nature of the Land, and sheweth the severall sorts of Wood, and how to plot out the same to most delight.



O which purpose let all men use their utmost endzavours and skill to lay their Woods and Coppices, or Spring of Woods, as dry as possibly they can, for Wet and Coldness is as prejudiciall and offensive to the fruitfulness, thereof, as it is to Corn or Grasse, or any Fruit-Trees, whether Apples, Peares, Plums, Cherries, &c. All which though every man indeavours little herein, and though to their ancient Spring-Woods little opportunity can be gained, yet what can be gained hereto prosecute it, as of great Advantage.

And for a new Erection of Wood, where never any grew and raising of a new Plantation, which is one of my main designs, a Piece so little practised, which before I have fully ended, you will wonder it should have been so much neglected being so feasible.

Therefore when thou hast designed a Piece or Plot of ground thereto, which should be dry, sound, and pretty hearty, thou needest not much matter what nature of Land it be; so that thou canst but get two Spade-grass, or one and an half of good Earth, before thou either come to the strong Clay or Land, yea though it have some Gravel, or Stones, be it but well mixed with good Earth, it may do well; yea best of all, because of hollowness and lightness of it, though it should be very boggy Land, yet if it have any richness
of

of nature or heart in it, thou shalt find a marvellous suitability therein, to make a very good Improvement this way, yet the most natural Land hereto in the Experiences I have made or seen, is your warm, open, gravelly, sound Land, the richer the better, as aforesaid.

When thou wouldest plot out thy Land thou designest to plant, which thou mayst cast out if thou aim at thy delight and pleasure onely, either into a Square, consisting of four Equall sides or else into a Triangle, having but three equall sides or else into a long Square, which hath two equall sides longer, and two equall sides shorter, or an Oval Capacity, or else into a Circular plot either as thy phantasie leads thee, or if thou mindest onely thy profit, and intendest onely to raise Wood for thy use, & increase, and the Countreys service, it matters not into what form thou cast it into; how ever seeing the first is as easie & no more chargeable, to cast or lot out thy Wood into an Artificial uniformable plot as to do it rudely or confusedly: I rather advice it but press it not, no further than as to the Gallantary and delightfulness of it, or thy spirit thereto, wherein may be as much pleasure, Delight and Recreation, as in your curious Gardens, Orchards, Walks and Bowes, especially being planted about a Mannor House; or dwelling place, for warmth in Winter, & shadow & Coolness in the summer; for which Advantages many of the nobles & Gentry to this Nation would give great sums to purchase; Which hereby may be obtained at an easier rate.

Therefore having cast thy Land into any of the plots aforesaid except the Circular, which I conceive of least suitability of all to this work, then suppose it be ten, twenty, or thirty Acres, I suppose less, if thou cast it into a Square or Triangle, or Oval way, then having found the middle of it, thou mayst if thou please, cast out a Circular round Plot or Oval, containing either a ninth part, or a seaventeenth part, or but a fifth part; and that Incompass in with a little Ditch, well quicksetted with thorn, and here and there an Ash, Oak, Elm, or Witchazell, reserving a Grass-plot to walk round about, of fifteen or eighteen Foot wide, and

The most natural Land to plant with Wood,

How to cast our thy Wood-plots for pleasure.

Method and confusion to thee bring of an equal price, and probably be the cheaper

How to cast our thy plot into most delightful divisions.

Planting
Strawberries,
is excellent

then equally divide the rest into so many parts as thou intendest severall falls therein, & every Division separate with a walk, or Grass-Plot betwixt them, containing fifteen or eighteen Foot wideness, which will serve as a Cart-way, or Passage, to fetch out thy Wood at every fall, as well as for walks for thy recreation, because in this manner of Planting, thou canst not Cut along thy Wood, as thou dost along thy usuall spring Woods, - but onely along thy Borders, which when thou hast so divided all by Ditches which make thy Divisions, thou may if thou pleasest to cast thy Banks outward, and set thy Hedge inward, Plant the Banks with Strawberies, which will delight themselves herein, & grow fruitfully, either on the Sun or shady side. Now when thou hast plotted out thy ground, prepare for Planting, and first inquire, and search about the Country for Set-gatherers, such as will bring them every two days fresh, for the fresh gathering & sudden setting of them in their places, is of more Advantage to the furtherance of the growth, than thou imaginest.

How to get
thy sets for
planting.

Secondly prepare such Servants here as will not deceive thee; And avoid the getting of Eaten, Bitten, Rough, and Brushy, all being unprowable sets, receive them not, but give them such wages as they may afford to get such as are fruitfull and proveable, and if possible get them from off as hard Land, as thou Plantest them upon, however be sure they be thriving smooth Rooted, or smooth Barked sets, of what sort soever they be, & as straight as possibly thou canst procure.

The quickest
growing wood.

Thirdly, for the severall sorts of Wood quickest in rising and growing, generally are your soft Woods; as Poplar, Willows, Asp, Sycamores, Maples, Witchazell, &c. your Ash is a gallant thriving Wood also, and indeed for quickness, and profit too, it is the best in my opinion, some good Oak set will do very well, and Elm also towards your outsid; but if thou resolvest to be a Planter to purpose, then thou must be a sower of all Seeds of the severall Woods aforesaid, or setter of many Sciens, and a Breeder up of Nurseries continually, for indeed were Planting more in fashion

fashion, Sets would prove very scarce, which now for present are plentiful enough, and in most part of the Nation may be had for two shillings, or two shillings six pence a thousand, some more some less according to the goodness and bigness of them, and dearness of the Country for workmens wages, & indeed the lesser the sets the more certain of growing, but the bigger they are, the faster, and sooner they rise to their growth, only some of them may fail. What Sets are best.

Fourthly, having prepared thy Sets, then set to Planting of them, which I advise after this manner. All thy Borders made, or but cast out, thy Sets must be all Planted in the same way as thou wouldst Plant, or as usually men do Plant a Thorn hedge: First cast up by a Line a little Ditch about two foot and half, or three Foot broad, just so deep and but a little deeper than thou canst rake up good mould, and so as all Labourers begin their turning Turf do thou, and then lay up a little mould, and there lay thy first Row of Sets, some say three Sets in each Foot, but I conceive if thy Sets be good two may do very well, then cover them. How to plant thy Sets.

Secondly, raise another Border about nine Inches above that, thy Mould or Bank layed well ashore, or sloping, and there plant another Row: and cover them well also, as men do their second Row of Quick-sets.

Thirdly, cast up another Dike against that like a double Dike, so as both may meet together upon the Top, and lye close together, and then plant two Rows more of Quick as was directed on the other side, and if thou hast any quantity of space, betwixt thy two upper Rows of Quick, thou must plant one Row upon the Top, or two, if thou seest cause, if thou hast room to spare; And so thou must go on throughout thy whole Plantation, a Dike and a Land or Bank, and again another Dike and a Land, and so throughout. And be sure however thou do, to plant all thy Sets in the over-most best Mould or Earth, that thy Sets may neither root in stiffe-binding Clay: nor hungry Sand, and fear not, leave no Land undigged or unwrought, nor plant none in Green-soard by no means. How to plant thy Quick, and mould them also.

then equally divide the rest into so many parts as thou intendest severall falls therein, & every Division separate with a walk, or Grasse-Plot betwixt them, containing fifteen or eighteen Foot wideness, which will serve as a Cart-way, or Passage, to fetch out thy Wood at every fall, as well as for walks for thy recreation, because in this manner of Planting, thou canst not Cart along thy Wood, as thou dost along thy usuall spring Woods, - but onely along thy Borders, which when thou hast so divided all by Ditches which make thy Divisions, thou may if thou pleasest to cast thy Banks outward, and set thy Hedge inward, Plant the Banks with Strawberies, which will delight themselves herein, & grow fruitfully, either on the Sun or shady side. Now when thou hast plotted out thy ground, prepare for Planting, and first inquire, and search about the Country for Set-gatherers, such as will bring them every two days fresh, for the fresh gathering & sudden setting of them in their places, is of more Advantage to the furtherance of the growth, than thou Imaginest.

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How to plant thy Sets.

How to make thy Dike to plant thy Sets in.

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Thirdly, cast up another Dike against that like a double Dike, so as both may meet together upon the Top, and lye close together, and then plant two Rows more of Quick as was directed on the other side, and if thou hast any quantity of space, betwixt thy two upper Rows of Quick, thou must plant one Row upon the Top, or two, if thou seest cause, if thou hast room to spare; And so thou must go on throughout thy whole Plantation, a Dike and a Land or Bank, and again another Dike and a Land, and so throughout. And be sure however thou do, to plant all thy Sets in the over-most best Mould or Earth, that thy Sets may neither root in stiffe-binding Clay: nor hungry Sand, and fear not, leave no Land undigged or unwrought, nor plant none in Green-soard by no means.

How to plant thy Quick, and mould them also.

'Tis a simple Piece I confesse to make good the issue promised, but when thou hast proved the truth of it, then thou shalt be better able to judge of it. Many Objections will be raised against it, but let not the simplicity thereof offend thee; for I shall assure thee, I will give thee such a President before I have done; and leave the thing so clear, that there shall not be left the least cause of Suspicion.

CHAP. XXV.

*Answereth severall Objections against this
Projection, and gives a President for ma-
king good the same.*

Object.



Hat you will lay your Land so dry and deprive your Sets of all Moysture; that it is Impossible they should grow at all, especially in dry, sandy, or gravelly Land, much less to grow to such an Increase as is promised.

Ans. 1.

Hath two branches; First all Sets and Plants for the most part require Soundness, and warmth, and were many of our Spring Woods more dry and warm, they would prosper much the better, although much dry, haskey, sandy, hungry Land doth not many times afford a thick Coppice, or good Spring, which is especially occasioned by reason of the Barrenness of the Land, and the ill Husbandring of the Spring after falling, not Preserving of it from Cartells bruising of it, as will appear more fully before this discourse be ended. But secondly, Experience shews the same, that upon a sandy gravell Land, all the aforesaid Woods prosper exceedingly in the way of the aforesaid Planting, in so much that should I tell you the Experience thereof, you would a little wonder at it.

Ans. 2.

2:

A new Erection planted twelve yeares sithence, at the Eleventh years end, a Fall was made, & so much VVood cut upon the same as was worth or sold for sixty pounds an Acre

Acre or more; it was much Pole-wood, yea a good part of it made Spars, and some part of it small building Timber; that a Gentleman of that County builded himself part of a very good Barn, the whole Roof of it with that Timber; and this year was another Sale of Eleaven years growth of as good a Value, the Land it was planted on was worth about ten shillings *per* Acre, and every Acre cost somewhat under seven pound an Acre, al Digging, Quick-sets, and all charges in the Planting of it; And the second Crop they make accompt will be as good at eight years growth; And to me it seems possible, it may, if not better, This President is at *Billing* at the Earl of *Thomunds* in *Northamptonshire*, managed by a most Ingenuous Gentleman called *Mr. Cartwright*.

A President of Wood planted that one Acre was worth 60. at 11 years growth.

What an Acre costs planting.

This way of Planting will certainly be so thick, that they cannot prosper one by another, or else it is Impossible the Earth should yeeld Fruit, Heart, or Sap, to so thick a Plantation.

Your Spring-woods, in some parts of them grow as thick, especially where your old Roots grow so thick, as you can scarce set one foot betwixt them, and every Root may send forth twenty or forty Spineyes, and yet all nourished from the Earth, & these Stools they grow upon also.

Ans. 1.

Secondly, I answer that Experience hath also made it good as aforesaid; For other Planters in these parts Planted a foot or more asunder, and yet came not near this, nor is neither half so much in quantity; Nor yet the other thinner Plantation, although little or never the whit the bigger, or taller than this, which is so thick Planted, nor never worth so much by the Acre of many more years growth, as this at the Eleventh year.

Ans. 2.

And for the effecting of this Design, thou must take in two or three more particulars, one is a strict Observation of the Season in Planting; And then secondly your Demeanure towards it after Planted.

First, The Seasons are as soon as the Leaf is falln, the earlier the better, fail not to be well prepared of Materials to begin with *November*, and so thou mayst continue three

A a

month

In the 1st of
January
1601
No Observa-
tion of the
Moon...
Ecc. 17. 4. 5.

months complet untill the end of *January*, and possibly some part of *February*, but it is somewhat hazardous, and may exceedingly fail thy Expectation. And for the Moons Increasing or Declining, matter it not at all, nor any Season, Wet or Dry, Frost or Snow, to thy Labourers can but work, and be sure that what Sets be gathered one day, may be at the next if possibly, or next after; And shouldst thou be occasioned by any hindrance, to keep thy sets longer Unset, be thou sure thou get their Roots into the ground, well covered with good Mould untill thou canst set them, and be not drawn away to the contrary by any Workmans perswasion whatsoever, for though the lying out of Mould or Unset, do not kill them, yet will it so backen them that thou mayst lose a full half years growth in them.

Weeding necessary. Secondly, Thy Ground thus planted, thou must be careful in the Weeding of it; for I know no greater cause of this so great Advance than this: The keeping of the Ground

clean from Weeds, and as mellow and open as possibly, which will cause the Roots to shoot exceedingly, and the Plant to grow abundantly, thou must for the first & second year prize it, and dress it almost as a Garden; And therefore be sure thou preserve it from any Beast, Horse, or Sheep biting it, in the least measure; should Cartell break in they would destroy one years growth in a moment.

Boggy-Land
will bring forth
a Plantation of
Wood.

As for Boggy Land, much of it that is perfectly Drained to the bottom, that is little worth will now in a Plantation of Wood to good Advantage, especially your Poplar, and Willow, and Alder, your Ash will grow well also; But therein you must observe to make your Dikes and Draines so deep that you may lay it completely dry, you must goe under all your Bog, to the cold spewing-Spring & near a foot below that, & then what you plant upon the Bogs of Lands you may expect a wonderfull issue: 'Tis very common in four or five years that the Willow rises to gallant Hurdle-wood, & in five or six yeares, to Abundance of Firr-wood, and small Pole for Hops, and other Uses. One Acre of new Planted Willow upon some Land not worth.

worth two shillings an Acre, may in Seven years be worth near about five pound, in some parts an Acre; and in some parts of this Nation more. And I verily beleve were all the Bog-Lands in *England* thus planted, and Husbandred well, after these Directions, might raise Wood enough to maintain a great part of this Nation in Firing; and for other sorts of Wood, the well Ordering & Nourishing it, although in Lands so bad, would produce a wonderfull profit, far more than I will speak of.

And I suppose, he is no ill Husband that can raise a bog to a double advance, considering some of them are worse than nothing; but when they are so exceeding Coarse and barren you cannot expect such Fruitfulness or dvan ce; as from that Land that is of a fatter or better nature; For certain all plants and Woods will do much better, on better Land than on coarser; and in case thou shouldst bestow Soyl or Manure on thy Land before thou Plant it, it would be both Labour and Cost exceeding well bestowed and conduce much to the nourishing of a young Plantation.

What one A-
cre of Willow
Planted on
Boggy Lands
may be worth.

Now shall follow a piece or Device how to thicken your Springs or Coppices, where they grow thin or are decayed; Which fully observed, may doubly improve the same, & such a way is here projected as is little used in any Woods where I ever yet came, and as unlikely also to any thing I have yet spoken unto, which is no more but this, at every Fall where thy Wood groweth thin, take a good straight Pole or sampler growing of Ash or Willow, at the usuall growth of the Wood, and Plash it down to the Ground, about four or five Inches above the top of the Ground; nor cutting it wholly off, and cue off the head of it, and put the over end of the Pole after the head cut off, a little into the Ground, which thou mayst do, by bending it in the midst like a Bow and so thrust it in, and so fasten it down, once or twice from the middle of it, and upwards, close to the Ground with a Hook or two, and out thence where any branch would put forth standing, will put forth lying, and more and more grow up to Plants and Poles, as the o-

How to thicken
Woods that
Planted on
Boggy Lands
may be worth.

then Spring doth, and so you may, though it be uncapable of Sets, or Planting with the Root, lay over all your Vacant places, and thicken your Woods where ever they are wanting.

A president of
a wood thick-
ned.

And let me beg of thee thy credence here, it is most certain, I speak out of my own Experience, one of the gallantest Woods I know in *England*, it is constantly used at every fall in some place or other of it; the Wood is eighteen fells, every fall eighteen years growth; their very Faggots made at length of the Wood (besides all their Pole-woods) all their brush being faggoted into the Faggot, were this year sold for one pound three shillings four pence a hundred, & forty Faggots make a Load; it is worth about twenty five pounds an Acre every fall: Study warmth all that possibly thou canst, for any Plants are helped much in mounting aloft thereby; therefore as I conceive they prosper worse upon your cold Clay, which nourisheth the Tree little, and hath no quickness nor life to quicken the growth thereof, but by toughness and coldness of the Earth the Sap is shut in, and cannot get in to spread so frankly as it should, and so instead of thriving of the Tree, the most prospereth more fruitfully than the Tree.

Elm plants.

Your Elm Plants may be gotten of young sprouts growing forth of the Roots of the old Elm, many thousands, which being slipped and set, will grow very fruitfully.

Sicamore
plants.

Your Sicamore is a very quick growing and thriving Wood; especially if it be planted upon some warm, sound, and rich Land, they will thrive wonderfully, and rise to gallant shade, excellent to make Walks & Shaddow-bowers, useful for in ward building, where better is wanting, & for firing where wood grows scarce.

As for Sets of this nature, if you go to any place where Sicamors grow, and there in the beginning of the Spring you shall find the Seeds chitted up and down as thick as possible; which gather up, and set them presently, and you shall have your increase at large, being planted curiously from any the least prejudice of biting, breaking, or shaking the said Trees: after planting; according to the first directions.

Sith

Sith the destruction of Wood increaseth so upon us, the which I should not so plainly reprehend, were there any care, zeal, or industry in the planting new; therefore I shall take boldness to enlarge my discourse a little further, and by way of addition speak a little more particularly to some speciall sorts of the most serviceable usefull Wood now growing, or necessary for the supply of the Commonwealth among us, hoping thereby to convince some of profitableness, others of the fecibleness; some of the commodiousness, others of the usefulness, and all of a possibility to recover some hopes of supplies hereafter, when the old stock is yet more wasted on purpose to provoke the ingenious to the Work. Old *Vergil* hath this passage;

That if of Woods he should frame a Song,

To Princes & they daubing

He make so bold as ad to this,

If Rulers slight it, 'tis much amiss.

And if the *Romans* ordained that Consuls should have the Charge of Woods, that Timber might not be wanting for Shipping, and Buildings, and publick Works, I hope our States will judge it a *unum necessarium* among us. *Venice* at this day appoints an Officer for the Woods, who sees to planting yearly, as well as cutting down; and because we may be left more naked & convicted of our weakness in this grand neglect of so great a publique & personal good as is the advance of Timber, I shall hereby inform you, that there is scarce the worst Land we have, but will bear as good Oak as the best Land in *England*. I have read, it was a generall Custome amongst the *Ancients* that when they found any so barren Earth as would not graze, they presently plowed it, and sowed it with Acorns, Ashkeyes, &c. and all other sorts of Wood-seed. We should grow wiser than our Fathers, and we may easily outstrip their experiences; but herein of all things else are we beneath them, they the planters, we the destroyers.

I shall therefore pray we may set upon this so good a

Land as well
imployed by
planting wood,
as any way.

Work, every man do a little. I shall therefore affirm, that we can scarce tell how to imploy one acre of ground to more and greater advantage than to the sowing of it with Wood-seeds a bed, or two in a Garden of each would be a sufficient Nursery to plant many acres; some to be drawn forth one year, some another as the Plants grow in bigness, so they will require to be drawn forth to give the other more room; I dare say that should every Gentleman of a good Estate, but maintain one or two acres as Nurseries of all sorts of Wood, he might be furnished to plant every year a thousand Trees, and so as he drew his plants, repair his nursery again, and need not have one hedg-row unplanted with good Wood and Timber.

A president of
50. years
growth of Ash.

And for further incongruement herin, I shall further say, that Trees well planted, and carefully preserved, will grow to good perfection in one age, especially if the ground be open and loose, and not too binding. Many men in *England* have set a Tree, and lived to see it come to such a growth, as hath been worth above twenty shillings, near thirty; but I have been credibly informed by a gallant ingenious Knight, who reported of his knowledge, that a Gentleman in the Low-Countries, or *Germany*, planted one hundred ashes, and at the end of fifty years resolved to sell them, and did, the price for which he sold them was five hundred pounds; and he that can improve so much Land better, I shall desire earnestly to be his Scholler. The same Knight also affirmed that he knew another Merchant there, that planted so much wood in his own Life, that he would not take 50000*l.* for. Then how much Wood may be planted in this Nation, & the Lands not less worth than now they are. I know some Lands not worth above 6*s.* or 8*s.* an Acre, that hath yielded in wood above 50*s.* an Acre *per annum*: And if this Government should compel all men to plant five-times as much as they destroy, they compel them to their own great advantage & honor, witness my aforesaid English Northamptonshire President.

Now to those common & most usefull Woods among us a word or two, & first of the Oak, that non-decaying timber

It is somewhat slow of growing, by reason of the weight substantialness, and worth thereof, yet will in the way of ingenious husbandry quit his cost & charge bestowed; you may either plant it from the Set, or Acorn; from the Acorn I advise because then you may chuse your seed from a likely thriving Tree, which sowed in a Nursery, or on Beds of purpose, no disparagement to your Gardens, or Orchard Nurseries, to have a Nursery of all sorts of Woods planted among them, I know a gallant Gentleman in Kent, most ingenious for publique improvements, as well in waies of Husbandry, as publique services, who main- taines a constant Nursery of all sorts of Wood-plants from the Kernel, among his Nursery of Orchard Fruits, and is so stocked with all sorts of Sets, not onely to supply him- self, but may furnish a great part of the Country also it is Colonel *Blunt*, living within a mile of *Greenwich*, not on- ly honourable in his name, but in the effects and fruits of all his actions.

Oak plants.

A president for Nurseries of Wood.

I conceive it is indifferent, when you sow or set your Acorn, your ground prepared and in good tillage; but why not at or in *October*, as soon as they be ripe, or in the Spring early; but be sure the Acorn be full ripe, and the best time to remove them, or transplant, may be in the end of *Novem- ber* or *December*, into your fields where you do intend they shall grow, being planted a good depth in as good double field mold; which done, you must be as carefull of bicing, shaking, or breaking of them as you are of the Nursery, un- till they be so rooted and fished so strong that they will endure a beast rubbing upon them, which had need be ab- ove seven years; and if you intend them for Timber, cut not off the heads by no means, but chuse strait and smooth thriving barqued Sets as you can, and support them from shaking with the wind for two or three years at least, until they be most firmly rooted, so will they run up strait and tall, and prove gallant large Timber; and in the remov- ing of them, be very carefull of bruising them also, for if for Timber, you bruise the top or head of any part, better cut it off; but if you intend them for lop or shade, or for bearing mast,

Open loose
land the best
for any wood.

An Oak above
40 yards in
Timber.
Another ten
yards thicknes.

maſt, then cut off the heads of them, they will ſpread the better, enlarge their boughs and branches further, and yet make good Timber too, & very good, though not ſo long, yet may poſſibly be as profitable as the other. The Oak agreeth well with any Lands, good or bad, Clay, Grayell, Sand or mixed Land, warm or cold, dry or moiſt, as appears by the naturall growth of it in all Countries; but for artificiall planting, I ſhould adviſe to a middle mixed Land, yea though it be but barren, it thrives excellently upon as barren Lands as any are in *England*; the coldeſt, ſtiffeſt Clay is worſt for all ſorts of Woods, your open looſe Lands is beſt for any Woods, or Fruits, and the Oak takes not pleaſure in your richeſt ſoils of all but I queſtion not the wel proſpering of it there two, & may be the cauſe why ſo little of it is found upon your richeſt Lands, may be, becauſe the Land may, or is put to a more profitable uſe; for this I muſt needs acknowledge, that in many parts where Land is rich and dear, or lyeth near great Towns, and letteth at great prizes, the wood being in danger of ſtiding and ſpoiling by Wood-ſtealers, the Land may turn to greater profit; yet however, where Land is good, I ſhould adviſe to ſome wood, though planted here & there a tree in hedg-rows, & where they may not prejudice the graſs, or ſhade the ground, it will be not onely an improvement in good meaſure of the Land, by adding to the income the fruit thereof, as well as of the graſs, but an honor & delight unto your ſelf and Poſterity. The Oak-maſt maketh fat ſaſt fleſh, and long laſting Bacon, and will feed Deer, Sheep and Poultry exceeding well and profitably. I have read of one Oak in *Westphalia*, from the foot to the neareſt bough, one hundred & thirty foot, and twelve foot thick, and of another ten yards thick, which may poſſibly be; but I am ſure profit and honour ſufficient will attend an ingenious plantation of any ſorts of Wood.

This is moſt renowned for Shipping, or any the ſtrong-eſt and moſt enduring works or buildings, or for the moſt curious Wainſcot, or indeed for any uſe whatever. I ſhall be brief in all the reſt, becauſe that much that I have ſaid in
the

the planting of this may be applied to the rest; the Barque is of as great worth, as of need and use.

The Beech is also a mast-tree, and very usefull and profitable, both in the Body, Branches and fruit thereof. Beech wood
the use and
fruit. The Body is very good Timber for the Joyners use, and for the Husbandman for Axol-trees, and for much Building, and the bough for Firing, and the Fruit for feeding Hogs and Deer, and I know not whether for Poultry or Sheep, but it makes meat sweet and delicate light of digestion, but not so long lasting as Peas or Acorns. It delights most in your warm Land, it growes well upon gravelly Land, and Lands very stony; and in the Chiltern Countrey, and sandy ground, and barks not the barrenest Land, likes well, and better the hill and mountains than the plain: The Barque thereof is usefull for the floats of fishing-nets, and pantofels for Winter, and if you spoyle them of their Barque, they die. This wood groweth somewhat quicker than the Oak, and is more inclined to some Countries than to others, especially your wood-land parts.

The Elm groweth easily; it is all heart if it be fallen in his season, which is when the sap is fully and clearly down in the root betwixt November and February; it takes great delight in ditch-banks, and dry places; they will grow thickest of any wood whatever, and prosper, and as I conceive the most advantageous planting them is in hedge-rows, or in little Plumbs of themselves. As for the Elm-seed, I can say but little, because I never made experience thereof, onely it is affirmed that there is a male and a female of the Elm, and that the male Elm beareth seed, and not the female; which if it do, then the seed when it is ripe may be sowed as other seeds are upon a bed by themselves, and fine mould sifted and cast upon them, and if they be dry, they as other seeds must be watered, and so sowed in little rows, that a little trench be betwixt row and row, that they may not root one into and upon another, but so as that they may be taken up again with more ease, to remove and transplant where you please.

You may get Sets of the very roots which sprout forth of

it, and set them; and they will grow; and very many affirm, that any Elm, or a very chip: when the sap is firm & proud, will grow unto a Set.

How to raise
Elm-plants.

But this I had from a Gentleman of credit as a speedy & unfailing to raise Elm-sets or Plants; w^{ch} is, dig round about a well-grown Elm a foot or more from the body, unto many, or most of the Master-roots, and cleanse away all the earth, and then cut the root almost quite through with an ax, and so serve most of the roots, and if you cut some full through, you may, and forth of both those ends of the root you cut or divide in sunder, will come forth gallant sprouts, or plants, which you must take off with a little part of the root, or a little chip thereof, and plant it, and it will assuredly grow to a good Tree.

The use of the
Elm.

The use and worth of the Elm is little inferior to the former; it is of absolute and singular use, especially for water-works; good for building, where it may ly constantly dry, or constantly wet, but sometimes dry, and sometimes wet, it will not long endure: It makes excellent plank, and good board, the best wood in *England* for Wheelwrights Naves or Hubs for wheels, and good for felly timber also.

In your second plantation, or removall, set them in very good order, and be carefull of preserving them as a garden from shaking with wind or cattel, or from biting or rubbing by all means.

Some write, that in your second removall you may do best to tie some knots of some of the string, or twist them like a garland, and then set them and tread the mold down about the roots; this annoynted with Bullocks dung, but my self having made thereof no experience, cannot press it all I say is, a small master w^l make out the experience, which I encourage to. The Elm groweth to great worth, in little ground, delights in found warm Land, dry, sandy, gravelly, or mixed Land; but it must have good store of mold by all means; it doth not delight in cold moist clay, nor spewing weeping Land. One Acre length wide of rows of Elms upon a ditch bank, at their full growth may be worth 20, or 30 l. It runneth up generally to the greatest height

height and length of any Wood in England.

The Ash is also a gallant quick-thriving Wood, but it takes not so much pleasure in a hard, barren mountainous Land as the Oak or Beech do. It will grow in good Land, and in Land of any nature or temperature almost, wharsoever; it will thrive reasonable well upon a Boggy ground, so the same be deep Trenched to the bottom, and laid dry and sound. It delights itself in dry sound Land, and will grow very fast if it like the Land; faster than any of the aforesaid Woods; witness the Dutch Precedent I brought before, speaking of the excellent and great advantage Wood might yeeld in my discourse about the Oak, which There forbear.

The description of the Ash.

The use of the Ash is most manifold; good for Building, and for any work where it may lie dry; most prime for Coopers Hoops, & Rims for Sives, and Wheels, as Oak is also; and excellent for the Wheelwright, Ploughwright, and the Husbandman; far tougher than any of the woods aforesaid and very rich and profitable; and the best Firewood, fittest for Ladies Chambers, will burn exceeding well and sweet, though green; but all this excellency unless for firing is quickly spoyled. If you fall it forth of season, it will be worst of any Wood bare the mistaking of the season; the Worm will take it speedily, & make it the most unserviceable of any wood whatever. The onely season is from *November* untill the end of *January*; for if the sap begin never so little to arise, forbear falling Ash. It spreads his root very large, and so is most offensive to your Corn land; because it both draws away the hert from the land, and offends the plough by his roots.

The use of the Ash.

Season for the Ash is falling.

You may sow the Ash Keyes; which are the onely seed, in beds by themselves, and they will grow amain; two or three good beds will store a Country; draw them as they biggon; and at last draw all away, or else they will destroy your Nursery: plant them in *January* or *December*, mould them very well and carefully preserve them; cut not off the top if you would have it to grow in length; it being a pithy wood; it wil somewhat endanger it; but it

may prosper well, though cut a little off the top, & spread better, and be very usefull both for Timber, Lop, and firing. I have heard of a poor woman that had two or three Ash-trees in her Garden hedge, and a strong wind came and blew the Ash Keyes all over the Garden, that at the Spring, her Garden was turned from that to a hopefull plantation of Ashes as green as a leek above the ground, the woman was at a great debat, to loose her Garden she was loth, and to destroy so hopefull a crop she was unwilling: at last she resolved to let them grow, and now her garden is turned into a nursery, and she is turned a planter, and hath ever since maintained it to that use, and made many times more profit than she did before.

The best sets
&c.

The best time
to remove Ash

The slips from the roots are not so good sets as the scions or sprout from the Key, that is far the best Set, being straight and smooth barked, and free from canker. Their removing must be in the depth of winter, that it may have a whole winter to fasten the roots, the roots may be cut in the removing, a little, but the strings no whit at all. It is a Tree of marvellous great advantage to the Common wealth, and very profitable to the Planter. *Pliny* writes that the Serpent so abhors the Ash, that it will rather choose to run into the fire than through the Ash boughs, but no more of this.

Birch

The Birch tree will grow in the barrenest land; it will not prosper in good land, it is good for some common meaner uses, as to make Oxe yoakes, and somewhat usefull for the Turner, but most especially for the fire; where wood is scarce and deere, it may be worth your planting, or where the land is so barren that it will beare nothing else; *Theophrastus* writes of it, that it will grow in frosty, snowy, cold Countreies, and on the hardest gravelly land, and therefore on the barrenest land they plant Birch, Pine wood, Firre, Pitch tree, and Larsh.

The Walnuts

The Walnut of another use, & that beareth a very gallant delightful fruit, taketh his pleasure in dry found wholsom land; the usuall way of raising them is from the Nut, set or sowed, and preserved a year or two in the Nursery, and then drawn forth and planted; it will not indure cold nor moysture,
and

and seldome any grow in your strong clay land at all; if they be well planted and preserved, they will make a good shady walk, or set in row at a good distance will prosper very well, but they require great room, and good land, it groweth to a great bignes, and is very usefull for any household use, excellent for the joyner, and curious for the Gunsmith, and the fruit thereof is most delightfull and no less profitable.

The use and advantage of it.

The willow though *Homer* calls it an unfruitfull Tree, yet I shall ingage much in the praise of it; it is the quickest of all wood for growing, and riseth more in one year than many doe in three: And for profit, I must question whether any can or may come neer it; it comes off with less charge than any, and hath a prehemony in lightness and toughness, and is very serviceable for spades and Gunstocks, and manifold uses more, to be kept dry it will scarce ever decay; It delights in low ground wet and shady, yea the most watery the more suitable, and yet will grow upon a dry bank, and in the Champion also: It is very good for firing also. It is to be planted of young sets cut off of any bough, about two foot and a half long, or somewhat shorter, set or thrust into the soft earth or soft ground, almost any bog, being cast up in great lands, and on each side thereof a Trench so deep as to go a little below the bottom of the bog, and these set a foot and a half a sunder in strait lines or else two foot a sunder; the sets being thrust into the earth within eight or nine inches of the top; and this to be done in *February* and beginning of *March*, and in three or four years it will come, if it prosper as it should, to make windings or hurdle wood, in a year or two more to make hop-poles, and great sets to be planted at seven or eight foot length, to be set for Trees about eight or nine foot distance by river sides or little brooks, or more, if you would not have your ground shaded, which must be secured by stakes or thorn, or some other means for two years; from rubbing or shaking with wind or cattell; it is conceived, that those planted moyst thrive fastest, but those upon a dry land indureth the longest: be sure to cut your sets a little

The Willow.

aslope at the heather end, and set the biggest end downwards, and close the earth pretty close to it when it is set, and cut off all twiggs that come out of any part of the set. They may be cut as you have occasion to use them, at three, five, or seven years.

Osier his use
and how plan-
ted.

The Osier must be planted after the same manner, from short sters as above said, & must be planted upon very good land, and then it will yeeld a crop every year, & may possibly be worth three pound an acre or more: is of especial use for Basket-makers, and fishermen for making Leaps & instruments to catch fish in. The Osier is quick of growing & very profitable in its use, you may plant them where the Sea ebbs and flows, and covers them all over, for that they have but a time now & then to lye dry, they will prosper no less there than else where: you may maintain some standers here and there of two or three yeares growth, to make big plants or supporters for your great work.

The Lime tree.

The Lime Tree is also newly discovered as useful in our English plantations, but it groweth to be of great credit among our Gentry, & thriveth exceeding well upon midling land, makes a fine flourishing Tree, and being headed and set in walks in rows, makes a very gallant shady walk, they begin to be much planted about *London, Surrey, Kent, Essex, &c.* It carrieth a very fair smooth leaf, somewhat like the Beech Tree: And as for the fruit of them, and the manner of planting them, I shall say no more, but leave each man to his own experience & say all till I have further experimented them, and shall say that they are most probably exceeding profitable, and what hath been said of other Woods for the manner of planting may in a great measure be applied to this.

Causes why
the Reader di-
gest not the
Discourse,

So I have done for present, Which particulars, if thou hast seriously perused, although thou hast passed many thing, offensive possibly, which hath been the Authors desire justly to Administer: And if any thing unjustly have offended he is very sorry, and hopes, and verily believes it either ariseth from want of a clear Representation of his meaning in more Significant Terms, or Artificial Language

gauge

guage to the Readers mis-understanding of the Authors Sense, or mis-conceiving of his way of of Practice, wch I beleve upon a second unprejudiced Consideration, will more clearly represent it self unto him. As for the curiosity in its composition, or Exact Method in the handling, bear with the want thereof, thou must expect no better from a Treatise of this nature, Rudely digested out of Confused principles & Notions, & from Experiences most of them Completed but some in present practice, which when thoroughly Experimented, (If these weak Discoveries find acceptance with thee, and shall appear with the least Advantage to the Common Good (if God be pleased to give opportunity, he may present thee with a second part to the same Tune; wherein he hopes to Compleat or make up the whole part of practicall Husbandry, or give thee in a whole new Plantation of old England.

As also something may be Digeſted after the uttermost Improvement made upon thy Lands, how to make the best Improvement of thy Stock, to greatest advantage, it is possibly able to yield thee and the Nation, or what else shal fall into Experience in the interim as fit for Publique covery under the nature of Improvement; Thy loving acceptance hereof and practice therein will undoubtedly Command.

The Authors
promise to
mend.

And though I have in some things been too Tedious, which I could not well avoid, yet I hope I have dealt truly with thee, I am sure in my own Experiences, I can make good unto the Eye what I have pretended to thy Ear, and what I have also seen in other mens, I have Represented them in Truth as near as my abilities were able to judge of them, or I able to receive their information; Therefore I have acquainted thee where thou may discover Truth in all. And if I have taken any thing up by bare information, it may fail in some circumstances, but I hope and do in good measure know it doth not, nor shall not fail, in the substance thereof, and will still here be made good or clearly hold out a double Improvement, it will be worth acceptance, so me it hath been worthy Respect and Imitation,

The author
clear, his en-
deavours are
for publique
good.

1. Piece. *Englands Improvement: or,* Chap. 25.
tis, when I could but advance any Land, one half or third
part, by any Information) but if I have made out clearly
to the Nation the severall opportunities of such vast im-
provements, that there is such Lands, and such Capacities
to advance them, as I have held forth in my Title page, &
have also as truly shewed that they have been done alrea-
dy, and may be done for future, with the severall Wayes,
Rules, and Means for their accomplishments: & that also
at so rationally, easie, and familiar cost and charges, and
principally and chiefly by the poor Mans labour, who
cries for it, and must have it: I hope I shall not be accom-
ped or at least not Scandalized as a projector, but as a
poor and faithfull Servant to his Generation. Farewell.



THE
SECOND PART
OF

Englands Improvement.



Ow I shall proceed to the Second part of my
Discourse according to my promise, and shall
therein endeavour the most clear and candid
discoveries of six more Pieces of Improve-
ment; all of the most advantageous for the
Improvement of Land of all sorts, and under all capacities
have yet ever been discovered, some whereof, and very ma-
ny I yet never read one word of, nor so far as I can find
out, or hear, have yet ever been published, unless you please
to take that for a Discovery which is by a Subintelligitur,
as I conceive Mr. Speed that superlative Improver (and
some

Some such others) to whom can they make good but one quarter of what they affirm, they neither can want Money, Clothes, nor Scholars, I know some of the succeeding particulars are the deep mysteries he will impart for composition, & how he came by many of them too, but that they are many of them of his own experience, or to that advance he speaks of, I affirm the contrary; and much fear the news he tells us too good to be true.

The man I know, and have conversed with him, and have known him some late years, and while his Books were private and conveyed into Noble, and Gentlemens hands, particularly by himself, and his own Agents, I could bear it, and suffer wiser than my self to be fooled, because I was not wise enough as to beware of him, but now they come to be sold in the Stationer shops, and spread abroad the Contry to deceive, and beguile the Nation, I cannot forbear.

He tells us his discoveries are methodically distributed, and so they are, just as if you should put a man to his choic, whether if a man would give another as willingly two hundred pounds as one, and would give him the two hundred pounds first too, whether he would chuse the one hundred pounds. So after he hath first told us of a certainty to raise two thousand pounds *per annum*, with less than two hundred pounds stock, which I wonder who will refuse, and close with another of his offers, which is, with five hundred pounds stock, to raise a thousand pounds *per annum*? which of the two is more probable, yet less desirable than the former, but both of them to be effected with money. Yet me-thinks I could hearken to his fourth particular, which is to discover a way without charge, whereby an industrious man, of a reasonable capacity and fortune, without prejudice or dishonour, may contrive to himself five hundred pounds *per annum*. Himself exceedingly wants such a discovery, or else wants the reasonable capacity he speaks of; for sure the fortune he speaks of he cannot want, being a man of so vast a mind, large understanding, and great experience, unless his experiences have eaten away the rest, which to me

seems improbable unless they be to be found visible. These things are gallant in contemplation, but more sadly experimented, which you will hardly find by sea or land, nor any other place but in Mr. *Speeds* chamber, I beleve.

He tells us by his fourth *Item*, that with less than fifty pounds stock visible a man may advance a thousand pounds *per annum*; but I fear either the invisible must be ten thousand pounds, or else his thousand pound will drop short by nine hundred and eighty; and if you grant him credence, or that there were a possibility in him ever to affect it, why should any man so much abuse himself as to make use of his following *Item*, which is two hundred pounds stock in three years to raise four hundred pounds, and in three more double the four hundred pounds, &c. The which he affirms but in probability, and yet the other upon certainty; but that of probability may be, and is most evidently experimented, & was by many thousands before Mr. *Speed* was born; but why any man should lay out two hundred pounds, when with fifty pounds he may raise a hundred and sixty times as much therewith, I wonder far greater than those he holds forth in points of Husbandry as to advance land two hundred fold, from five shillings to fifty pounds *per annum*, &c. and many more, in all which I shall say no more; but refer thee to his Book and his personall Discoveries; for I must and will lay him down the Gantlet: For there is enough to advance the Common-wealth, if not to choak it; for many times when men are brought extreme low, either by sickness or penury, and restored, as this Common-wealth is, suddenly to plenty, or a good stomach, surfeit and undoe themselves suddenlier with plenty, than by a sparer dyet, or a more moderate condition; and so I fear may this Nation, if they embrace so high discoveries too hastily; yet embrace them I pray, but with sobriety: and remember him also that ran mad upon the beholding of his great Treasure; for such variety of *Extraordinaries* may make men wild, and run from one to another, not knowing where to close or stay, and the gazing after these Princely Incomes, if they look after it till effected, may make them

look

His book is
but to draw
thee to his
chamber to tel
thy fortune
there.

look their eyes out also; but enough hereof.

Yet let me lament the sad condition of our Times, and I fear the neglect of our Government too; for to very many members thereof, if not to all, he hath given his Bookes, whose fault with humble submission it is, that so great discoveries should still be clouded, and yet not put in practice, and the Common-wealth thus bleeding, while either by a Patent, or rather, and that I am sure for the value of one or two dayes pay at most of a common Clerk in some Offices would effect it; for truly the man is very conscionable, and desires not a full condition, but chuseth a very mean one, and will accept of too little in all conscience for his discoveries.

I know to whom hee made many of them, and would have done all the rest for less than twenty shillings, if the mans patience would have received them, but most like he not being able to bear them neglected the embracing of the.

And whether I have, and shall speak forth any of the things he mean, I will not be peremptory, but beleve I have, and shall most of them if opportunity last, but shall never endeavour to hold them forth in that Luciferous, yet watery lustre, lest it blind my Reader, but truly and nakedly to discover them, their nature and use, with that reall and feacible advantage may be made thereof, which will satisfie a sober spirit; and if by chance I make a discovery of what is concealed, much good may it doe the Common-wealth, for I shall reap the fruit of my design, *An opportunity to discover publique Advantages*. And whosoever desires cordially to be informed of Mr. Speed may from Mr. *Samuel Hartlib*, dwelling against *Charing-Cross*, who can give fuller and larger description both of the man and his abilities, having expressed him self so far a Gentleman of such charity towards him, as he hath maintained him divers moneths together while he was inventing some of these his discoveries as I was informed from a very knowing Information.

And now to the six Peeeces of Improvement contained in the ensuing discourse, held forth under these Heads.

- 1 By sowing the Trefoyl or Claver; and St. Foyne, and the advantages hereby.
- 2 By facilitating the great charge and burthen of the Plough, with the figures of them.
- 3 The planting of Weld, Woad, and Madder's three great dying commodities.
- 4 The planting of hops, Saffron, and Liquorish, and the profits thereof.
- 5 The planting of Rape, Cole seed, Hemp, and Flax, and their Increase.
- 6 The Improvements that may be made by some Orchard and Garden fruits.

CHAP. XXVI.

Contains the best way of planting Trefoyle or great Claver Grass, which is the highest advantage our English Lands will produce.

And herein I will discover the best seed and the best means to gain it, how to sow and husbandry it for food and seed, with the most suitable land thereto, and the profit that may accrew thereby; and for brevity sake shall speak little to what other publique spirits have discovered, but enlarge a little from later experience in relation to our English Lands and Husbandry.

Seed described.



Right seed is the best peece in the whole work.

Here are so many sorts of Claver, as would fill a volume, I shall onely speak of the great Claver, or Trefoyl we fetch from *Flaunders* called by *Clusius*, *Trifolium majus verticum*, which bares the great red Honyfuckle, whose leaf and branches far exceeds our naturall Meadow Claver; it bears a very small seed as Mustard seed, not so round but longer like a Bean; the best is of a greenish yellow colour, some a little reddish, but the black I fear will not doe well. The choice

choice whereof is the onely peece in the whole work.

Your *Dutch, Holland, or Low Country* Seed, or from the lower parts of *Germany*, is very much of it very hazardous that comes over hither, but being well chose there, the transporting of it by sea is no considerable prejudice unto it, but much that is sold in the Seed-mens shops in *London* was either corrupted by the *Dutch* before it came thence, or else parched by over-drying, or else by the Shop-keepers, either mingling old and new, or keeping it another year and then selling it for new: I my self within this four year sowed divers Acres with seed bought in *London*, which cost me about two shillings a pound and lost it all; I am not able to say any one seed came up at all. And I have heard that the *Dutch* out of an evill spirit, lest we should find the same benefit they have, have kiln-dried it. Therefore my advice is, to send over a knowing man that hath had experience of it, & knows the right coloured seed to buy, and search all the Countrey and buy the best and choicest Seed he can possibly buy for Silver, and take care of the bringing of it over too; and as for the sale of it, if you bring over more than you shall use, you need not, nor shall not want customers to take it off of hand; for I had rather give a double price for such, than run the hazard of common Merchants experience.

Claver sowed
but none came
up.

But if you desire me to speak my mind from the experience my self hath made, I do affirm that our own Seed, that is, Seed of our own Claver, after the first sowing of the *Dutch* Seed, called the great Claver, is the best, and most certain Seed to grow, and so successively from time to time, if you can ripen it kindly, get it dry, and preserve it. And this will bring me to my second particular.

The best is of
our own grow-
ing.

Which is how to get good Seed, or recover it out of our own Crop to sow again, if you could get it kindly out of the husk, which to us as yet is a mystery, and we cannot doe it artificially and feacibly as they do in *Flaunders*. The best means we do use is to thrash it out of the straw; and then chafe it or clense it from the straw, as you do corn, and then polt it, or fault it as some call it, that is, beat it over again in the husk, and then get out as much of the re-

2.

I have heard
of one that got
above 2 bush-
els out of an
Acre.

A new way of
getting out the
Clover forth of
the husk.

fuse by chaving of it with a narrow toothed Rake as possi-
bly you can get; which done, if you would bestow sun-
ning of it in a hot dry season, and then rubbing of it, will
get very much of it, for this is all the means that hitherto I
have ever heard of in *England*, but I am confident that it may
be very feacibly got forth of the husk, being very throughly
dried in the Sun, upon a Corn mill, Oatmeal, or Mault-
mill, and shelled as they do Oats, by a skilfull Miller, and no
seed hurt as they will Oats, and not break the kernel, having
his Mill-stones exceeding levell hung, neither too sharp nor
too dull, and very curiously set that it cut not the seed, nor
yet leave too much seed behind; which if it prove, as I am
confident it will, it will be a very great advantage to the
Nation. This upon the very writing hereof came into my
mind, which I am very confident of the performance of
the work, and resolve to make the experience thereof, if God
blefs my Crop of Claver this summer. So far as I have hi-
therto seen or heard, our own seed sowed in the husk, hath
proved the best, thicker and certainer than that sowed of the
pure seed it self, and so shall fall into the third particu-
lar.

The best way of sowing of it, & I do verily beleeeve, that if
the husk be but once cut and shivered a little that the Seed
may but scatter, that it may be best to sow it with the husk
or chaff because it supplys the filling of the hand better than
any thing I can find out will doe, with these two Observa-
tions.

1 That you be sure to find out a fit proportion of husk
and seed together to sow an Acre, & that I cannot prescribe,
unless I knew how clean you could make it; your own ex-
perience will discover that perfectly.

2 That you be sure ever and anon to stir up the bottom
of your Hopper, or Seed-lop, because the Seed will sink
downward, and keep your seed and chaff alwaies in an even
mixture and composition, lest you sow that part thicker in
the bottom than that that lay overmost; but should you
fail of purifying the seed from the chaff for private use it
may do best of all, if the hop-bowl or husk be but cut and
that-

shattered as aforesaid: but if you sow that Dutch seed, as that you must of necessity till you get into stock of seed of your own, then the best way of sowing it must be by mixing of it with Ashes of wood, or coal coarsly sifted or with saw-dust, or good sand or fine mould, or any thing else that will help to fill the hand, & wil spread wel forth of the hand, but I like not wel the taking it up betwixt the fingers & the thumb; or the two fore fingers and the thumb, because they cannot scatter the seed so broad nor so even as they can out of their ful hand. And this I must press as one of the most weightiest things in this Husbandry; to have a most especial care of the even sowing of it, your care herein must be far more than in sowing Corn for these Reasons.

1 Because the Corn with much harrowing (which this will not abide) though uneven sowed will be drawn into wants and uneven places, and much regulated by the Harrow.

2 Because your Corn is of a heavier and fuller, and weightier substance, and will spread well of it self, but this is so small and little in bulk, sowes a land that it cannot be discerned how it spreads, and whether even or uneven.

3. Because the wind, though very small, hath powe over this, and not over the other, and how ever you must chuse a calm time as possibly you can, many times early in the morning, or late at even are your calmest times. You may sow it upon any Land you intend to graze upon, any bare places in a Meadow or highwaies troden and poched, and it will soard them; but the usuall way is thus advised, when you have fitted your land by Tillage and good Husbandry, then sow your Barley or Oats, and Harrow them in, and after your Claver upon the same Land, and covered once with a small Harrow or Bush, but sow not the Corn thick as you usually did, but if you will lose this Crop, you may sow it of it self.

Best time to
sow Claver.

And lastly, because if your Corn should miscarry, it is but for one year; but this for many: and as you sow once you must often reap, and will never cover or soard kindly, if

evancs

evenness be not effected, to the compleating of which you must have a sober staid Seedsmān, that carries his hand high; takes his steps even, and delivers his seed out of his hand at one equall and constant breadth and wideness. It is my constant cry to my own Husbandmen to take heed of Plough-balking, and Harrow balking, but now I say in a more especiall manner, take heed of Seed-balking. The best season for it is in the beginning of *Aprill*, or in the end of *March* rather, if it be likely to be a dry season; late sowing may do in a fruitfull season, but yearly is most certain.

4.

The fourth particular is how to preserve it, and mow it, and make it most usefull for Seed and service. I have heard much talk of three Crops, and truly if it be not reserved for seed, I am confident in a fruitfull year it will well bear it, nay may be more; for though I love not fauning, neither affect I smothering the Thuth nor to eclipse any new discovery, I therefore say that if the Seed be good, and the Land either good naturall, or artificially made good by Husbandry it may very well bear three Crops, two to cut, and one to graze, and the first Crop may by mid-*May* be ready to cut; for this I say, and most will find it, though they otherwise speak high, that this grasse will be best alway to be cut green, and before the stalk begin to grow too big, and begin to dye and wither, unless it be for seed: Therefore, as experience will teach, it will be excellent good to cut it green and young, and give it cattle or horse in the house; for if you cut it to keep, it will go so near together, as it will doe but little service dry, yet being cut young it will be very good and sweet, and either feed or give milk abundantly; and then after the first cut, let it grow for seed, and herein you must be carfull that it grow till it be full ripe, for it will not be very apt to shed. And if it grow to seed, I cannot conceive of what use those stalks which are so hard and dry can be of, unless it be for Firing in a dear Country, so that the seed must be the advance of that Crop onely; and so it may well enough, and you may have a good after pasture, and may graze it untill *January*, and then preserve

To know when
it is full ripe.

preserve it; but if you would know when your Seed is ripe, observe these two particulars.

First observe the husk, and when the Seed first appears in it, then about one month after it may be ripe.

But Secondly, try the seed after it begins to turn the colour, and the stalk begins to dye and turn brown, it begins to ripen, and being turned to a yellowish colour, in a dry time mow it, and preserve it till it be perfectly dry any manner of way, and then about the middest of *March* thrash it and cleanse it from the straw as much as you can, and then

foulter and beat the husk again being exceeding well dried in the Sun after the first thrashing; and then get out what seed you can, and after try what a Mill will do at the rest, as aforesaid more at large; but I will give way to a better

When and
how to get out
the seed.

Discovery. I need not prescribe a time either in *July* or *August* as best to cut for seed, because some years and lands will

ripen it sooner than other will; therefore have respect to thy seed and straw according to former directions; but when thou art got into good seed, thou maist graze it upon thy land, and then be sure not to let it grow too rank and high; for if the stalk grow big, cattell will balk it and stain it more, and it will not eat up so kindly at first, nor graze so even

afterward, but exceeding much Milk it will yeeld, and feed very well, but to affirm as some have done, and do confidently unto this day, that it will grow upon the barrenest

Yeelds much
Milk, and seeds
fat Beef

ground as is on *Windsor* Forrest I dare not; I have known that there it hath failed; and I am confident must, without exceeding great cost and husbandry, yet that very Land well

A great mistake
about Claver.

Manured and Tilled, Dunged, Limed, Marled, or Chalked, or otherwise made fat and warm, will bring forth good

Claver: and other rich commodities, as they do in *Flanders*, upon so coarse Lands bestow good cost, and that will do: The nature of the Land is good, but the spirit of it is too low to raise it of it self. And this is all is held forth

in the discourse of the *Brabant* Husbandry, exceeding barren Land, but well Dunged and Tilled, and then Clavered; not that it is the barren Land, but the good and costly

Husbandry; onely the oldness of the Land, and restiness

Old Land better than the Tillable Land constantly plowed, and being of the same fatness and barrenness, and no better; yet I verily affirm that Tillable Land well husbanded, and layd down with Claver, will do very well also. The quantity of seed to sow an Acre, as I conceive, will be a Gallon, or 9 or 10 pound, though some are of opinion less will serve turn. And so I descend to my last particular, which is,

How much
seed sowed in
an Acre.

5 To set forth the Lands most suitable for Claver, with the annuall Profit that comes thereby.

Therefore, as above, I say your old Land, be it coarse or rich, as it is, or hath been disused from Tillage long, is best for Corn; so also is it the best and certain Land to Claver; and when you have corned your Land as much as you intend, then to alter it to Claver is the properest season.

The lands
most proper
for the Claver

1 As to the nature of the Land, as I conceive your dry, warm Land, naturally good, betwixt ten and twenty shillings an acre, or your poorer dry Land, betwixt one shilling to ten shillings an acre, well manured or soyled, and brought into perfect Tillage; and to speak properly and plainest, any Land that will bear good Corn, will bear good Claver.

2 Your earthy, well mixed Land, of a middle temper, will do with good Husbandry as aforesaid, as well as the former.

And lastly your naturall cold Land, well Husbandryed, laid up very dry and warm, and brought into good Tillage, every Land laid high, as the nature and coldness of the Land requires, and every furlong drained, and the furrows cleansed up by the Plough at last, will bring almost any Lands into a very good condition for Claver, and the better husbandried the better for this use also.

This I shall lay down for a generall Rule, that whatever Land is neither too rank or fat for any sort of Corne whatsoever, is not too good to Claver, and you shall alway find it best Husbandry, and best possit upon your best Land, unless, as aforesaid, you recover the barren Lands up to a good and

Chap. 26: *Reduement of Land to pristine Fertility*

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and rich condition, which is also the far better Husbandry than to lie pelting and moyling upon poor mean Land unfatned by some soyls or other, therefore I advise every man to plow up no more than he can exceeding well overcome by his purse and husbandry, and let the rest lie till he have brought up his other, and then as he hath raised one part take up another, and lay down that to grase, either with Clover or otherwise: And let him that flatters himself to raise good Clover upon barren heathy Land otherwise than as aforesaid, pull down his Plumes after two or thee years experience, unless he devise a new way of Husbandry.

And as to the annuall Profit that may accrew thereby, I The Annuall shall little differ from the *Flanders* Husbandry, but shall affirm that one acre after the Corn is cut the very next year if it be well Husbandryed, and kind thick Claver, may be worth twenty Marks, or twelve pound, and so downward as it degenerates weaker, less worth. In *Brabant* they speak of keeping four Cowes Winter and Summer, some cut and laid up for fodder, others cut and eaten green; but I have credibly heard of some in *England*, that upon about one Acre have kept four Coach horses, and more all Summer long, but if it keep but two Cowes, it is advantage enough upon such Lands as never kept one: But I conceive best for us, untill we be come into a stock of Seed, to mow the first Crop in the midst or end of *May*, and lay that up for hay, although it will go very near together, yet if it grow not too strong, it will be exceeding good and rich, and feed any thing, and reserve the next for Seed: And if we can bring it up to perfect seed, and it will but yeeld four bushels upon an acre, it will amount to more than I speak of by far, every bushel being wooth three or four pound a bushel; and then the after math, or cadish that year may put up three middling Runts upon an acre, and feed them up: all which layd together will make up an Improvement sufficient, and yet this property it hath also; that after the three or four first years of Clovering, it will so frame the earth, that it will be very fit to Corn again, which will be a very great advantage: First to corn your Land, which usuall yeelds a far

profit of Clover Grasse.

Clover fits for
first coming, and
fourth coming for
clovering.

I. Piece. *Englands Improvement: or, Chap. 27.*

better profit than grasing, and sometimes a double profit, and sometimes more, near a treble profit, and then to Clover it again, which will afford a treble, fousfold yea 10 or 12 fold Advance, if not more. And so if you consider one Acre of land with the Claver and Husbandry thereof, may stand you the first year in twenty five shilling, the three other years not above ten shillings, the Land being worth no more, which may produce you yearly, easily five, six, or eight pound *per annum per Acre*; nay some will affirm ten, or twelve pound or more; then most of my Improvements promised are made good, as in my Frontpiece is he'd forth under this first Piece of Improvement.

CHAP. XXVII

*Speaks of the usage of St. Foyne
and La-lucern.*

Proceed to the discovering of the use and advantage of St. Foyne a French Grass, of which I must use plain dealing, and not put my Reader upon improbable experiment; as is my chiefest aym. And as in some part of my former discourse I promised to bring down to our practice some Out-landish Experiments which were hinted at and discovered unto Mr. *Hartlib* by Letter to be a great deficiency to us in our Improvements the non-practice thereof; so I must, and will hold forth no more than I can make proof of to the face of the world. Therefore my self having not made a full Experiment thereof, onely I have sowed of it this year, shall give the relation. of the manner of the Husbandry thereof, and the fruit you may rationally expect, and the Lands upon which it is to be sowed, and so leave it and you to your own experience and Gods blessing.

I shall not trouble you with the description of it as an Herbalist, because as in this, so in no other is it my design to search out the nature of any Herb or Plant in it self, but

as it is most profitable or usefull for my main design, *The Improvement of Land*

St. Eoyn is a French Grass much sowed there, upon their barren, dry, hasky Lands, and sometimes in our Gardens The description of St. Eoyn. hath a kind of it been much sowed, called the French Hony-suckel; it is of one excellent property yeeldeth abundance of Milk, and upon that account may be very advantagious to many parts of the Nation: it groweth best as it is said, upon the barrenest lands, hilly and mountainous, which I am induced to beleve upon this score, because it is rendred to be worth but nine or ten shillings an Acre, which some would not think worth experimenting, but if so, and it will grow upon our worst land, I am sure there is thousand thousands of Acres in England, not worth one shilling an Acre, and if that being sowed upon such land it will with one sowing advance it to that worth, and so continue for divers years, it is very well worth our imitation and practice; it will raise betwixt a load and a half, and two load of an Acre: Besides it is rendred to have another excellent quality, which is not to barrenize Land, but to better or fatten it, and after seven years growing it so roots large and many, somewhat like Licorish, that the Plowing up of them, is a very good soyl, and much fattens the Land for Corn: it is excellent for soarding Land the first year a great advantage. It hath been sowed in divers parts of England, as in Cobham Park in Kent, &c. where it thrived very well upon chalkie dry banks.

The seed is first to be had out of France, where it is sold for about three pence or a groat a pound, but here it was sold very dear at nine pence; ten pence, or twelve pence a pound this year. It is most like a Parsnip seed, only a little browner in colour, and somewhat rounder and fuller made like an Oyster, it is very light, and so many pounds go to a strike, and it must be sowed far more in quantity than you doe the Claver seed, because it is so great a seed; for ever the smaller the seed the further it goeth: I conceive for every pound of Claver you sow, you had need sow two of this, if not more; but I leave it to your own experience.

you will easily find a fitting proportion upon the first tryall; but the thicker the clofer it grows, and stocks the ground the better, and destroyes other seed or weeds.

The manner of sowing it may be with Oats or Barley & so much as grows up with the Barley may be cut with it, and then preserved, or else if it be very fruitfull, it may be mowed in the latter end of the year, and then preserve it for mowing for six or seven years after; for by that time it will have lost the spirit of it and be overcome by our English grasses; and then be fitter to plow for Corn again.

But if men will be at charge, the best way commended to me is this, to prepare your Lands and make them fine, as when you sow barley, and then plow in these seeds as the great Gardeners do their Pease, yet not altogether at so great a distance; but yet let them make their ranges near a foot distance one betwixt another, and the grass will flourish like Pease especially if they draw the plow through them once, or twice that summer to destroy all the weeds; but whereas he speaks of using the great Claver thus also, I am somewhat jealous he is mistaken herein, because the thicker it grows and the closer, with one continued thickness, the better either to mow or graze, The experimenting I leave to thee.

La lucern,

There is also the La-lucern, another French Grass, which is excellent Fodder, and is rather preferred before the St. Foine, and it is as advantageous to dry and barren lands, and hath been lately discovered there, and is now of great credit amongst them, but for my own particular experience, I can say little and therefore say thus much, only to provoke the Ingenious both unto the search, experimenting, and communicating to publick view, not one man being sufficient for the experimenting all discoveries that may be made here, and elsewhere, I am confident every Age, nay every day will bring forth something or other worth our embracements.

THE

The Second General Peece of Improvement contains the discourse of facilitating the charge and burden of the Plow, and a demonstration of the Figures thereof.

CHAP. XXVIII.

Discovers the severall Abuses of the Plough.

BEfore I proceed in this discourse, I will lay downe these two or three Maxims or Conclusions.

First, that whatever moveth upon the Land, or that worketh in the Land, and carrieth the least earth or weight with it, must needs move or work easiest. A wheel the lesser ground it stands upon, the easier it turns, and the lesser the wheel the easier still; so the Plough, the more earth or weight it carries with it, the more strength must be required. The naturall furrow it must carry, but the lesser compass both in heighth and length it bears upon the Plough, the easier the Plough must go.

Secondly, the more naturally any thing moves, the more easily, and the more Artificially, the more difficultly.

Thirdly, the sharper or thinner is any tool, the easier it pierceth, and the less strength is required; so contrary, the thicker or duller any tool is, the more strength must work it; and;

Fourthly,

Fourthly, that which is the plainest and truest to the Rules and admits of least multiplication of work, must needs be easiest.

All my endeavours shall onely be the application of all these to the Plough, and that as naturally as I can by truth of Workmanship, to discover the Plough and Plough-Irons to the most exactness, which will be all the ease that I can give it, or any man yet ever did or could: If any other shall endeavour to discover by Engine or otherwise, to supply the strength of horse and man to draw the Plough, I know an easie Plough will go more easie, and shall therein rejoyce.

And because I find so many different names given to the members of the Plough according to the Country phrazes, & few of one Country understands another Countries terms, I shall confine my self to one name to each member all along my discourse, for the better understanding of the Reader.

As for the Plough-sheath, Wrest, Beam, Share, and Coulter, they retain these names clearly in most parts and so I shall continue them.

But for the Plough-handler, some call them Stilts, and some Hales, and some Staves I shall confine my self to the name of Handles.

For the Plough-head, some call them the Plough-throck, some the Plough-chip, &c. I shall retain the term of Plough-head.

And the Shield-board, some call Breast-board, or Earth-board, or Furrow-board, I shall retain the Shield-board.

And for the Coumb, or Whing of the Share, which is that which goeth upward upon the Shield-board, I shall term the Coumb.

And for the Tush or Phin of the Share, which is that that cutteth out the bottom of the Furrow as the Fish doth divide the water, I shall call it the Phin of the Share, & so I shall avoyd multiplication of terms, and a littl shorten and clear my discourse, and so proceed.

As for the giving an addition of ease unto an ordinary

any way of plowing, and the taking away of some of the strength which is so great a burthen to the Husbandmans, is of very vast concernment, and will take up a very large discourse the effecting whereof I shall endeavour under these following heads.

- 1 To discover the severall abuses or hindrances to the welll-going of the plough, with some remedies thereto,
- 2 To give you the descriptions, with the Figures of several sorts of ploghs now in use,
- 3 To demonstrate wherein the chief ease of the plough consists, with the easiest growing plough and the advantage gained thereby,
- 4 To discover to what sorts of Land and seasons of plowing each plough is most suitable, with a double plough yet unknown, and a plough that shall both plow and harrow at once.

The Abuses or hindrances to be removed are many, whereof I shall speak to particular abuses only.

And first I shall speak to particular abuses only prejudiciall to the ploughs ease going in the Blacksmith, or he that makes the Irons for the plough, I not being of the opinion as many are, that the Irons should be made to the plough, but that the plough be made to the Irons; I therefore shall be bold to say, that if Plough Irons be not made exceeding true in all points, according to the Land you have to plow, and wrought fair and smooth, a plough-wright or plow maker shall not, nor cannot work true to a false foundation and if it be not wrought true, it shall hardly go true, unless after much wearing, being wrought into work, it may plow; reasonable well at last, and by that time the plough may be worn out, but never with that ease, nor continuance as it would by truth of Workmanship. Another abuse in him is the not steeling his plough-irons well, and making them exceeding sharp and well pointed.

The second abuse is in the plough-maker, who works according to certain coarse Rules he hath learned by trade, knows not how to hold a plough himself, nor to apply him-

^I
Plough Irons
made very
true.

self to the nature of the Land according to the alteration of it, nor scarce is able to discern the falsity of the Smiths workmanhip; and is not able to apply himself to all sorts of Lands, or those severall sorts of Tillage the Husbandman gives, he shall never make a Plough to go with ease by his rule, unless he chop upon it by chance.

3. The third abuse may be in the Plough-holder, and if he have not abilities to order his Plough, to fix and alter his Irons, and his Plough too, according to the severall natures of Lands he ploweth, and according to the manner of his Plowing, and keep his Irons in a true and keen posture: sometime he is to cast down his Land, sometime to raise up, and sometime to plow up hill and down, sometime even level Grounds, in all which if he have not some good experience, though both Smith and Plough-wright do their parts, yet because the Plough-holder cannot be made as well as the Plough, many good Ploughs are utterly spoiled in the usage or abuse.

4. May be in the Lands, when the Lands as come almost at any time, or with any Ploughs are not workable; or when Land is over-wet or over-dry: now all Ploughs are not to go upon all Lands, nor at all times but men must be so knowing, as to have their severall Ploughs for each sort of Land and seasons, otherwise they will moyle horse, men, and Ploughs unspeakably.

The remedies of these abuses. Now as to the discovering some remedies or cures against these abuses, and first as to the Smith, his Truth of Workmanhip lieth chief in these three materials of the Plough, 1 the Share, 2 the Coulter, 3 the Shield or Breast-plate (as some call them) Shivers: All which they being made true, and according to the naturall cast of the furrow, that so the earth stick not upon the Plough, but the Irons wear bright and clean, it is a good sign of the truth of Workmanhip on his part. I shall onely prescribe these particulars for the advantage of the Share; if it be a Share made with a pan to put upon a wooden head, then I do advise the pan be made pretty deep, and somewhat deeper than our ordinary Shares are made, but not too large or wide a pan in breadth, and the pin

phm made broad, descending or wheeling to the right hand; it hath these two advantages; first the deeper the pan is, the thicker and stronger may the head be put on, and the longer it will last.

2. The Tush or Phm of the Share will whelm the more being set down to the work which is the Levell or bottom of the head, or rather a little lower, which will give great advantage to it of clearing the earth at the throat, or first entrance upon the nose of the Shield-board with more ease, for if it stick there, it will be gone all along the Plough at once: A Share made most hanging from the very nose of the Breast-board, and not flat as most are; the figure whereof could I describe it like the side of a hill into a level meadow, would give a perfect demonstration of it, which I shall endeavour as near as I can; it should be pitched or set upon the Plough-head somewhat hanging also on the right hand, and the Plough-head pitched hanging also: As for the breadth of it, I leave that to each mans experience as his land requires; if upon a stony land, or twichy woody Land, it must be narrower, and the more stony the narrower; but if it be upon a gravelly it may increase in breadth; and so it may upon a clay, and more upon a mixed earth, and more upon a pure earth or sand; and most of all upon the Lay-turf, however upon all I would have it cut up very cleanly the full breadth of the Furrow thou carriest with thee, and not rend and tear it up with the breadth of the Plough, which increaseth the weight and strength; and most Ploughs are guilty of this inconvenience, especially where they goe with their narrow long pointed shares.

But now if you demand whether it be best to have the Coumb or Wing fixed to the Share, or put into the Share with a hole through and Riveted below, or whether to have none at all; but onely a shiver or plate upon the Breast or Shield-board, placed curiously upon the Share, exceeding tite, and as closely filled and wrought to the Sharepan as may be.

I answer, first, that could you have the Coumb or Wing so fixed, welded, or wrought solidly to the Share, with its

true whelming, hollow, crosswinding, compass, just answering the cast or turn of the Furrow, which cannot be described by a Figure: this being wrought fair and smooth, and as broad as possible you can get it, will be the best. And this is reasonable well done in many parts of *Hartfordshire*, in some parts of *Northamptonshire*, and *Bedfordshire*, and in many other parts, onely the Wing or Coumb is not broad enough; but the best pattern for this is upon the Bastard-Dutch Ploughs, who work them so broad, as they cover all the nose of the Breast-board, eight or nine inches broad, and twelve or thirteen inches high, and give the true compass of any I have seen, of this fashion in *Holland* in *Lincolnshire*, and many there are of them upon the Marishes and Sea-coast of *Lincolnshire*, *Norfolk*, *Suffolk*, and *Essex*, where the Dutch plough is much used, but the true Dutch share is otherwise so costly, and made especially for boggy, soft land, very troublesome and curious to be wrought, and more curious to be kept, and by our Country men the nicety of it will not be endured, nor indeed will it work in most part of our Country Lands, and therefore I forbear further incoragement thereto, than to this small branch thereof. The weelding compass of the Coumb.

But as to the fixing or weelding on the Coumb, I stand indifferent, because I think there is another way as good and easie, however let the Share without the Coumb be made as aforesaid, and then with a Shiner or Breast-plate curiously wrought a little hollowish at the nose, and so continuing along, being placed so close to the Share, that grass, straw, roots, or weeds get not betwixt it and the Share to choak it in the Breast; for then it is utterly spoiled of its ease: the Shiner will do best to be continued all along the Breast-board one solid plate compassed and crosswinding from the middle; the over end forward looking one way towards the Land, and the over end backward towards the furrow; and so must all your shield or breast boards be hewen or sawen, and compassed with fire, and wrought fair or smooth afterward. This shiner if wrought fair, as high as the earth works upon the plough, and have his true compass

pass with the Breast board, may also be of excellent ease to the plough; for after it hath gone, and is scoured bright, the earth will slip off, and pass away with much ease, and will carry no earth at all, which is to the great ease of the plough; and both these are better than a Coumb put through the Share-pan, and so come up along the nose of the Shield-board, and there nayled to strengthen the neck of the plough, or else put up into the plough-beam to strengthen it either; yet this I also prefer before those that have neither this, nor the aforesaid helps. And as for other fashioned Shares, whether made to the single wheeled plough, or to the double wheeled plough, whether with a pan, or without a pan, it matters not so that at the first entrance of the earth it be rightly compassed, and cast for the cleanly running over the furrow, and the Share point made very small, sharp, and well steeled, be it long or short.

2 As to the Coulter, his truth of Workmanship lyeth in this, whether it be Dutch or English Coulter, that it be well steeled and wrought sharp, and thin on the edge; the point also looking forward, if English, and the edge alway placed just forward, neither carving, or turning towards the Land, for that will alway be apt to draw the plough too wide, nor yet into the furrow, for that will be alway apt to work it to go too narrow, but just straight forward by a straight line to the pitch of the plough; but if a Dutch Couleer, then the wheel to be very well steeled, and about ten inches high, and to go as true as possible; for the false cutting of the wheel will make you work at a great uncertainty, which Coulter is not usefull neither upon stony, gravelly, flinty, broomy, gossy, or rooty ground, but upon pure turf, or pure mould, on which it goeth very easie.

The Coulter
how best made

very few find it
they find not
what is to
be done

The Dutch
Coulter.

The middle of the wheel had need be an inch thick because of wearing, and so wrought thinner and thinner towards the edge round, untill it come to be as thin as a knife if it were possible; but because this Coulter is with many of high esteem, and of some advantage, and yet not much known, I will give you the figure of it, as also of the best sort of English, for its compass, and a sharp thin well tempered edge, that

tends most to the ease of our English Coulter, and it shall be where I give the description of the Ploughs I intend to shadow forth.

And as the Plough-holder or Ploughman may much prejudice the ease going of the Plough, so one rightly qualified may in great measure advantage it; although the Plough be made never so exact and true; and therefore I give these two or three generall Rules to the Plough-holder, which are naturall to any sort of ploughs whatever, although there are some different rules appertenant to some particular Ploughs, as the double wheeled plough, and the Turnwrest *Kentish* ploughs, which would be too tedious to discourse, but these I leave to the plough-mans practice being easily found out by two or three dayes experience.

The first generall Rule shall be that the plough-man be able to judge and determine within himself the truth both of the plough-wright, and the Smiths workmanship, and in case he find an error therein at first to mend it; which is far easier done than after the plough or irons be wrought into a greater error; yea that it is possible it may not be recoverable.

The best way
for the tryall
of a new
plough.

And secondly, having his plough and all his Accoutrements compleated, then to the triall of it, and therein be sure to make the first tryall of your plough vpon land workable, and regular lands, not upon lands above measure hard rooty, rusty, twichy, or any way unfeacible; because upon such lands a true demonstration of the goodness and truth of the plough cannot be discovered; nor any Rule can be observed.

2 Because such lands will more easily and suddenly wrench, with, or put a new plough out of its work before it be wrought into its work. A rough new plough being somewhat like an unbroken horse, which may easily be spoyled in the hand of a violent mad-cap Rider, but if the horse be kindly used, and taken of his untamedness by degrees, by ease, kindness and patience, he is made a horse for ever; so after that in ordinary land, your patient discreet ploughman have well scoured your plough, brought it to a true

fur-

furrow both for breadth and depth, and set your Irons as it will goe it self with the very bearing of the hand to keep it steady, then you may afterward be bold to put it to any service, or any lands whatsoever the strength of it will abide, and it may be serviceable for many years.

Thirdly let him be sure having once got his plough into a perfect furrow, his plough avoiding all the earth as it takes it on at Breast, and carrying a fair clean furrow along with it, and turning its furrow cleaverly also from it, then let him not neglect a day, but iron his plough with slips or clouts in all the wearing places, smooth and even, and strengthen the neck of it with an iron bolt, from the bottom of the head through the beam, and there strongly drawn up and cottered fast, if he have none before, that the Head may not draw the leass, for after a plough is drawn in the Neck or Breast, it is probably wholly spoiled; and then always be carefull in keeping your Irons sharp, and clean wrought, your Coulter edge thin ground, and Share phin as sharp as may be, and very small point upon your share, all well steeled and tempered, your plough shall go with great ease and truth.

Plough we'll
clouted, and
irons sharp &
smooth kept.

But lastly, the plough-man must have a little regard to his Teem or Draught, and to the well geering or ordering them, if he will take all advantages he may or ought for ease, and therefore must alway make his Horse or Ox as suitable as may be, not some high and some low, but of an equality as even as may bee, much might bee spoken herein by way of reprehension and advice too but I must forbear, onely advise that if your horses be unequal for height, then place the highest formost, and so your higher next, and your lowest last; many reasons may be given therefore; however make your Horses and Oxen as equall as you can possibly, if they be unsizeable, your highest draw up your lowest, and your lowest draw down the highest therfore endeavouring all you can that all draw by a streight line is best, and preserves the full strength of your Teem or Draught for your plough, which otherwise you lose a very considerable part thereof, and let your Gears or Harnes be strong and easie.

Size your
Horses or Ox-
en equal.

Secondly

Secondly, be as carefull as in sizing them for their height, so also in matching them for their spirit as near as you can. A horse of a dull sluggish spirit, and heavy, is fittest for sluggish service such as your heavy loads, or weighty draughts, fitter for carting than plowing; your quick lively spirited Horses will be best for your plough, and the dull horses will be best to be placed together at what service soever, and then they will not deceive their fellows, which many times is the spoyle of many a good horse; your false deceitfull Horse that will draw but at his own pleasure, and fail you and his fellows at a stand or dead lift, as we say, is exceeding unserviceable, and must be avoyded as much as is possible: Yet if he be quick spirited, and full of metall, he may do best at plough and harrowing, and being sized with his fellows is usefulllest in that service of any other whatsoever.

A good character of a good Plough-man.

Lastly, he must be able to judge of his Land, and the seasons of plowing, and to sort his severall ploughs to each alteration, otherwise he shall not be able to plow all his Lands, nor indeed any at some seasons; and because of this I shall say more hereafter, I shall dismiss my plough-man with this exhortment, be as willing to learn as thou hast need, and abandon those poor silly shifts men make to preserve themselves ignorant and unserviceable, as they have been plough-men all their dayes and are not now to learn, and men may as well be too precise, and better ploughs cannot be made than their Country affords, and could better have been devised they would long since: With hundreds more so childish, as are not worth an Answer, but these exceedingly stiffe and choak Invention, and will do my Readers Imitation of these rude Discoveries.

CHAP. XXIX.

The second Generall, whereby I shall descend to the description of the severall Ploughes in use, and shew you the defects in some, and the Advantages others have, and what Addition I can give both from my own Observations, or otherwise, to make up as compleat an easie Plough as my Experience will make out.



Shall therefore confine my discourse to three or four sorts of ploughs.

First the Wheel-plough, I mean the double wheeled plough.

2. The single wheeled plough, and the foot plough.

3. The simple plain plough, without wheel or foot.

4. The Dutch Baltard, or plain Dutch plough.

Many other sorts there are, as some alter in their heads, some in their Beams, some in their Stilts, &c. and most in their Shares, and almost according to the Country of which they are, of all which it were too endless to discourse but I only name these, because I conceive all these usefull in some sort of Land or other, and a good Husband had need be stored with two or three sorts of them at all times, especially he that hath severall sorts of Lands, of all which I shall say but little, yet a word of each, but I shall reserve the main of my discourse for those very particular branches of the plough that shall make out that I shall give ease thereto.

And first, as for the double wheeled plough commonly called

called the Wheel-plough, and is of most constant use in *Hartfordshire*, and many up-Countries; and is very usefull upon all flinty, stony, or hard gravell, or any other hard Land whatsoever after it comes to be beyond its natural temper, is an excellent good form, & a very usefull plough, and very necessary that all great Corn-masters have one of these for strength, that so he may not force his other ploughs which are made on purpose for lands in a Tillable condition, & so are made more light & portable than these will bear to be, but these will go and work well with a great strength, when other ploughs will not to any purpose; and because much addition of ease cannot be given to this plough, which I shall not advise to but in the cases aforesaid, when and where other ploughs cannot work, these Lands being under an extreme. And as to such extremes, nor none else will any ordinary Rule hold, that I may not work against the stream, lest I swim along; I will only give you a short description with the draught or figure thereof, and as any addition may be given to the plough in any of its members, it shall not be restrained from an application to this as well as to any other.

This is usually drawn with Horses, or Oxen geered double two a breast, and indeed so they draw the strongest but tread the Land the more, but why they may not be put single in wet seasons, or in dangerous times, I know not.

Plough-beam.

Wheel plows
described.

This Wheel-plough is made of a strong clef Ash-beam, about six foot long, and is contrary to all other beams in the Compass, of is the crook or compass wherof looketh upwards, and the Land-handle thereof is placed at the great or neather end of the beam, as other ploughs are, for it is usually made with one handle, and the plow-staff is instead of the Furrow-handle, and is very long answerable to the length of the handle, the length wherof I much approve, and could wish it were observed in every plough whatsoever, it tending much to the ease and certain holding of the plough.

The Sheath is made of the toughest, youngest Ash, and perfect

perfect & dry that can be got, and set with a very good mortels
very much forward, joyned exceeding true and close into
the beam, and driven up so exceeding hard, with a bragget
behind it to hold it from declining, that it stands and will to
its work in the strongest land whatsoever.

The Head is pitched as strongly at the neather end of the Plough-head.
Sheath and Stilt as can be, and pinned through both, and
the Share is pitched upon the Head at a very deep pitch and
somewhat hanging, that so the plough may goe much a shore,
because the holder usually goes two furrows off the plough
wider on the near side the plough. And as it is pitched deep,
near a full yard pitch, so it is also very broad, being near half
a yard, and that I conceive arises from the former Reason,
because of the mans going so far wide of his plough. Their
Shares are made exceeding narrow, and very strong, and run-
ning out to a very exceeding long small point, very well steel-
ed, and sometimes they add a Tush or Phin, but they make
it very narrow also, and so it must needs be, the hardness,
and stoniness of the land not admitting of it. And the Coul-
ter stands a little above the Share-point, and not before it,
but rather behind it.

As for the Wheels that bear it, being eighteen or twenty Plough-wheels
inches high, are made of about six spokes of wood or iron,
fastened into a little short Hub or Nath, and a bark hoop or
iron binding round about them: they run upon an iron
Spindle about two foot long: which runs round in a Boul-
ster which the iron spindle beareth, and it is three or four
inches thick, and lieth betwixt the wheels about fifteen or
sixteen inches in length or more, and at least eighteen or
twenty inches in height, standing up to bear the plough-
beam, & upon the same Boulster goes up an Iron pin eight or
nine inches above the Beam, and to gage it for its true depth;
to the middle of which Boulster is fastened a short chain
backward with a strong iron Coller almost like a round
Ring which encompasseth the Beam, and is moveable, and
to be put forward or backward, to make the plough goe
deeper or shallower, as occasion is, and is held in its place
with an Iron Hammer, the helve or shaft all of solid Iron,



Page 109



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Page 110 Plaine Plough

The Double Plough
ploughing two
Furrows at one time



A hole
for a
wheel

and that is to be taken in or out of the beam at pleasure, to let it down or take it up as cause requires: and when the plough turns out of work at Lands end, it must have some cord or strong white-leather thong to come up from the boulder, to keep the beam from slipping off being empty. And so you have a short verball description of the Wheel-plough as it is used in most parts of *England*.

This Wheel-plough requires a great strength; and the greater because of the great length they are made of, which carrieth such a long and heavy weight of earth upon it, that it adds exceedingly to the burthen of it, which may be easily removed in some measure, by contracting the plough into a shorter, and somewhat narrower compass, and taking off as much of the weight and load both of Wood and Iron, as the strength of the work will bear upon which it is to be employed; yet it being a very useful plough upon some lands & at some seasons. The Figure expect with the other ploughs.

There is another double Wheeled-plough, & it is called The Turn-the Turn wrest plough, which of all ploughs that ever I wrest plough saw, surpasseth for weight and clumsiness: it is the most of use in *Kent*, *Picardy* and *Normandy*, and is called the *Kentish* plough with us.

The beam may be made of any wood for the bigness of it, but Ash is best; but the two handles are made of one forked peece of any wood, and the beam tenanted into the Split below the Fork, and so it runs down into the plough-head, and is there tenanted and pinned into the head; and as for the Sheath, that is a good strong peece of dry Ash tenanted into the beam, directly down right, but looking forward at the neather end, and fixed into the Head somewhat as other ploughs are, but the Sheath far bigger downwards: the plough-head is pitched at a very great depth, or else at random for depth, being carried with two Wheelles as the former, but nothing like so neat nor easie; and for breadth, it is pitched just under the Beam upon a straight line, and so it ought to be; as you shall see anon. As for any Shield or breast-board, it hath none at all on either side the plough,

as all other have, but a little peece of wood set along the Sheath forward, about five inches broad; closing upon the Share just as if you would cut a Die in the midst from corner to corner, and place the flat side to the Sheath, and the edge forward, which is their breast-board. The Share is put upon the plough-head with a pan half round upward, and flat downward, and is, or ought to be tulshed a little on both sides, as our ordinary ploughs are, and so runs out to a sharp point.

They have one Wrest or two, some one and no more, but sometimes two, which I should conceive alwaies and at all times best; and this Wrest is to be put upon pins, one in the Sheath, standing just under the Breast board; and the other unto a longer pin or round staff fixed into the bottom of the handle, as wide as the furrow, and this Wrest is no other but as a round stick about two foot long, or rather a half round one, with two holes in it to put the aforesaid pins into; and at every Lands end this Wrest must be turned on the other side; so if they have two must they both be altered also, and one placed two or three inches higher than the other, and the highest is to be placed broader by an inch and half, or two inches, and sometimes three inches than the lowermost to cast the furrow cleanly over.

And for the Coulter, that is also moveable in the Coulter hole, it being made very wide, at every Lands end, to which purpose they have a strong ground Oak-plant, about an inch and half over, that is very tough, and with that they will, having two pins placed upon the top of the Beam, one an equal distance from another, and both equally distant from the Coulter, wrest or writh the Coulter from one side to another, and there hold it till they come to the lands end, and there turn both Wrest and Coulter.

And thus you have a rude description of the Turnwrest or Kentish plough, and the Figure you should have, would it advantage my Reader half so much as it would cost the cutting; but they are so common in *Kent* all the Countrey over, and that so near *London*, that I had rather when thou hast a mind invite thee thither to see the thing it self
which

which will give thee better satisfaction than all the Figures can doe.

Yet thus much learn from hence, that the Land that lyeth so upon the side of a hill, as there is no plowing it upward and downward, may very well be plowed with this plough, and best of all, and it is especially usefull hereto; or if you have any flat leuell peece, where you would not have one furrow discovered, this will do it also; the foremost Horse or Ox alway going in the furrow, and the nearest alway upon the Land, and alway double; and I am confident it may be cast into a neater form, and made to very good advantage; the weightiness and ugliness of it I hate, but the Turnwrest conceit I like, which my occasions have not permitted me to experiment, of which I shall say no more at present, but that the Turnwrest to cast the furrow is very good and usefull for the two sorts of ground above-said.

I shall now come to the one wheeled Plough, and of that I shall give you also somewhat a large account, because it is an excellent good one, and you may use it upon almost any sort of Lands, which the Figure and description of the same, which shall be drawn into that shape and form that will admit of more lightness and nimbleness than any of the former.

You may see the use and fashion of it too at Collonell Blunt's near Greenwich in Kent, a Gentleman of great esteem and honour in his Country, who hath made very many of them.

The main Plough-beam is very short, about five foot long, made of very good wood, but small and light as may be, to which is another false Beam added below the Coulter hole, under the Uther and fixed to it by a Staple, drove up into the true Beam, with a capping upon the false beam end, or some other way, the form whereof is not much materiall, which false beame is that by which the plough is drawn, and gives opportunity by a Standard put into the end of it, bored full of holes; and passing through the

The single wheel plough.

the Master-beam, to let the plough up and down to any gage of depth or shallowness whatsoever, and indeed that beam is the guide of it.

The Sheath is pitched very forward from the beam into the mold of the Share whose Share-mold, as I may call it, is made as long as the Head should have been, & is of the same use as the plough-head is of, & is made of two small slips, not so heavy as the Head would be, & there being no head at all, the Land-handle is put into the Share-mould with an iron pin, and so is the plough-sheath also, and there fixed fast with an iron pin, and the Share forward made like another Share; and then just before the Breast-plate is a hole made through the Share, and there is rivetted, or else with an iron hook put into a long iron slip, which is made an inch, or inch and half broad, and so comes up to the beam just before the nose of the Shield board, and so runs through it, and is cotted upon the top of the Beam lying upon the Shield board, and the Shield board is compassed a little hollow in the very breast, and so from before the middle, begins to whelm and wind towards the furrow, and so winds more and more to the very end, and this Breast-board is placed close upon the Share, which is made with a long point, and broad or narrow phin, as the land requires; and sometimes, and any time any ordinary *Pau de* Share may be used, and placed upon a Head as other ploughs are; either with a narrow point for gravell or stoniness, or with a broader Phin, and long sharp point, for mixed, sandy earthy Land, as well as that fashioned Share, and be of the same use as I conceive.

The Pitch of these Ploughs are about, or above two foot in depth, and about eight or nine inches in widthness: This alway carefully observe that the uprighter you pitch your plough to get the narrower, and the more hanging, the broader. As for the depth, I conceive it is not much materiall, because it is born up from the false beam till it come to a true working pitch; and in the false beam is planted an Iron Axeltree, about one inch or a little more in bigness, and about one foot long nine or ten inches be.

before the end of the false beam, and put in square into the beam, that it may stick fast; and at the other end of the Axeltree runs a wheel upon it, about eighteen or twenty Inches, or may be a little higher, or lower, as you please, which guides the plough from that false beam, that it cannot sting or draw into the ground, & so is drawn at the end of that false beam, either with Horse or Oxen, with Cock or Clevies, as you have occasion or do desire; but because this plough cannot be fully discovered by the most familiar discourse, but will require the Figure also I will here give ye it, as near to the life as possible.

That which is the Standard, fastned in the lower beam, and runs through the over, to gage the plough, is made near two foot high, and in the over end is made two holes to put the Horse-raine through, to come from the Horse head to the very plough handles, to guide him to and fro, and under them divers removing holes, and one or two in the beam equall to those in the Standard, and an Iron pin put through them both. This plough neatly made, and very small hath been drawn with one horse, and held by one man, and plowed one Acre a day at sowing time in a moyft season; and as Collonell *Blunt* hath related to me, he hath with six good horses six men, and six ploughs, plowed six Acres a day at sowing time, in light well wrought Land.

The Figure expect with his fellows.

G g

CHAP.

CHAP. XXX.

*Shall discover some generall faults that may
be incident to all sorts of Ploughs, and
give you the description of the
Dutch and Norfolk Ploughs.*



Shal now proceed in this place, though not so Methodically as I should, to discover the usuall faults of many ploughs of all sorts, and most ploughs in *England* are tainted with some of them.

1 When they are made too big both of Wood and Iron, that is bigger than the work requires, they are the heavier to be drawn, carry the more weight with them, and require the more strength to draw them. A husbandman must have his severall ploughs if he will carry on his work comfortably.

2 Fault may be in the roughness and ill compassedness of the Share, as aforesaid; and when a plough is made too thick in the very breast; of this fault are many ploughs in some parts, and though it help well in the sudden cast of the furrow, and wil carry a great furrow with it, yet it goes very sore; of this fault are the plough in *Holland* in *Lincolnshire*, which otherwise have a gallant cast of the Shield board as I ever saw, which I have before at large described.

3 Is the shortness of the handles, by which a man cannot command his plough with that ease and truth as he might do if his handle had length and compass: A short upwright handle exceedingly dislike, a man having very little power to command the same, & when the plough is not truly held, it never goes easie.

4 The straitness of the Breast-board neither made nor drawn compass and cros winding for the cast of the furrow,

row, a very great fault to the Ploughs ease.

5 The placing the Wreſt even with the Breſt-board, and as long as it, or near as long, nay I have in ſome parts ſeen it longer. It is as great a hindrance to the eaſe and true going of the plough as any I know, and yet by very few diſcerned or reproved; I ſay, & had I time I would give reaſons enough to clear it, that a good broad Wreſt; and five, ſix, or ſeven inches ſhorter than the Shield-board, is beſt, which being at the further end ſet even, or a little under the breſt-board, and at the neather end where it is pinned, either to land, handle, or otherwiſe it be ſet two inches narrower and under the Shield-board, is both eaſie to the holder and to the cattle, and a main advantage to the turn and ſtrike of the furrow, and eſpecially the plough being made no broader behind than a juſt furrow breadth.

6 And laſtly the dulneſs of Irons, and either not clouting at all, or elſe uneven rough clouting and plating your ploughs, is a conſiderable hindrance both to the eaſe and laſting of the plough.

And theſe, or any of them all are generalls, and will hold, let them be upon what plough they will, or upon what Lands they wil, or in what ſeaſons ſoever, and are great hindrances of the good of plough and Plowing: And therefore what faſhioned ploughs ſoever you make; take heed of theſe Rocks, and for what ſeaſons ſoever you make them, avoyd them all, and then if thou wilt follow thine own Country faſhion doe, and God bleſs thee with it. I ſay not that theſe are all the faults, for there are many more, particularly treated of alſo aforegoing, but theſe are ſuch as may be prevented in any common fort of ploughs whatever, & moſt of them In al ſorts, & wil put ſuch an advantage to the ploughs eaſe, as with obſerving the foregoing directions alſo will be woth thy imitation

In *Norfolk* and *Suffolk* are very good ploughs in many parts of the Country, & upon the ſandy parts two horſes & one man will plow at ordinary ſeaſons, and almoſt any land of that ſandy nature, two Acres of a day, & many times one man with two horſes hath plowed three Acres in one

day: They seldom go with above two horses, and may with one horse, and one man; and if they plow any strong land, that they are forced to put in three or four, they let them double, and have but one man to plough and drive: Their ploughs are very small and light, and little compassed, all which are great advantages, but the greatest is the Land, which is a pure sand for the most part, and very easie working land; yet though this be the easiest, yet we have in many hundred places of this Nation very sandy light land, & very earthy mouldy land, a light mixed chissely land, a nd abundance of Errable Land in very good Tilth, where men usually go to plow with four horses or four oxen & a horse, and seldom less, but many times more (which might as well if not better be done with two) unless at seed time, now and then two oxen and a horse, or three horses and two men, which is a wonderfull charge to the poor Husbandman, the extremity of which charge were it but removed, would be sufficient of it self to make him thrive and prosper. I shall conclude this discourse with a relation I had from a *Norfolk* Gentleman of very good worth and credit in that Country. Upon the Marsh-lands bordering upon the Seacoast, a Gentleman set an hundred Acres to a man to plow, he covenanted with him to find him horse, and ploughs, & irons and meat for the horses, and he was to find onely all mans labour, and he allowed him eight horses for the work, and for the mans labour that he was onely to find to plow this land: the man covenanted to plow this Marsh-land, which is a mixed earth, & we have many thousand Acres as easie plowing in *England*, almost in al Countreis for 5^d. an Acre, & performed it; he plowed his 8 acres a day, he found but 3 men to the work, he went to plow with two Teams, two horses and one man to one plough, and two horses and one man together in the morning, & one man to shift them at noon, and meat and gear them, and then he brought in two Team in the afternoon, two horses in a Team with the same men, and so plowed, as aforesaid, his eight acres: I saw the ground thus plowed, & the poor man got his three shilling and four pence for his men and himself, that is tenpence

pence a day a man, which is good wages in *Norfolk*. It is a wonder that we should be so slothfull, when some are so ingenious.

A president of land plowed for 5 s. an Acre plough and horses found.

As for the Dutch plough I have also considered, which exceedingly differs from our severall fashioned Ploughs, therefore I shall not give you the large description thereof, because as it is the pure Dutch plough, it is only applyable to Fen and Marsh-land, where there is neither stone, nor root nor hard place, and the chiefest advantage it hath to ease and expedition is in the breadth and sharpness of the share which is made about a foot and a half broad, some more; and sharp in the point; and as thin in the pin as a knife, and wrought most curious: a good share being worth above twenty shillings, which casts up a very great broad Furrow, very clean, and easie as is possible, out of which I have contracted as much there-from, in the description of my Share as I can possibly allow to our uncertain changeable Land, to advance the ease which many times alters the temper and strength twice or thrice in one land.

And then for the Coulter, that is also especially applyable to the aforesaid Land, but may be used upon any fair, pure, lay, turf, being old pasture. And thus I have given you the description & leave it to thy imitation; a good one will cost a mark or fifteen shillings; onely say you can hardly have a Smith in the country to work well upon it, and far worse upon the share; but as to the bastard Dutch, which is somewhat nearer applyable to our Lands, I have taken from it as much as it will afford me both in the cast of the Shield-board, which is very good, as also in all the other parts of it, and do apply it to the plough hereafter described; and shall ingeniously acknowledge I have some branch from every of these roots, and from the *Norfolk* plough, and one wheeled plough also, from all which I find, that the shorter and lesser any plough is made, having its true pitch, with its true cast on the Shield-board, and short Wrist, and sharp irons, the far easier. Of all which having so seriously considered, made and tryed them almost every

The dutch coulter is applyable to any pure clean land.

The onely advantages for making the easiest going plough.

one upon severall sorts of Land, and experimented them to the full with my own hands to my great expence, shall descend unto my third General head for easing the plough.

CHAP. XXXI.

Thereby to demonstrate wherein the chief ease of the Plough consists, with the easiest going Plough, and the advantages gained thereby.

I Shall not with the least disparagement to any of them (giving them their due praise and honor) draw forth a description of the most easie-going Plough I can, & contract it to the least charge is possible; having all these helps and lights; and to add nothing thereto were a shame to an ingenious man.

The description of the plain plough. I will therefore take a short beam, deeper one way than another, of a tough and dry young Ash, betwixt five foot, and six foot long, rising in the Coulter-hole, and strong there; but thence declining both wayes for strength, and so growing smaller, wrought round and smooth, my Sheath most exactly fitted into the beam, and pitched pretty forward, and driven up so close with a little lace or bragget put behind the Sheath into the beam and Sheath, just butting at both ends when the Sheath is driven up, which shall stand as a Buttress to support it, and may be as serviceable as an Iron dog as many use; my nearer Handle put upon a Tennant through the same, and drawn close with two or three wooden pins, and then both sheath and handle tenant exceeding close into the head, being about two foot long, not standing upright nor level, but beam-handle and sheath hanging from a perpendicular point one fifth or sixth

sixth part to the Land on the nearer hand; my Furrow handle with two good round staves planted on my Land-handle, as wide in the ends as a man can hold them, being very long and wel compassed and fairly wrought; my share formerly described pitched true upon my head, and drawn up with an iron bolt through head and pan into my beam, and cotted up, my share standing rather more hanging than the head doth, so close and true, as that water cannot pierce betwixt them either with a Coumb weelded on, rightly compassed, laid into my sheild-board, placed as high as the earth works up, and as smooth as may be, to the end my breast not being too thick at the nose, nor widening too suddenly, and as soon as the earth comes to the middle my Shield-board to widen, whelm, or compass, as if it would lie upon the furrow, and so to widen and whelm more and more unto the very end; or else a shiner planted upon my share, most close wrought, compassed and nayled to the sheild-board in the form before prescribed.

My Wrest a large hand breadth, planked under my sheild-board bottom, and narrower than it, and rather yet narrower to the sheild-board end, so that it retain the just and full breadth of my furrow and no broader, it both goes easier, and helps the cast of the furrow: I desire it be well plated too, but shorter by five or six inches than my sheild-board, and by two inches than my Plough-head; my whole Plough bearded up so close as no earth may get into it, and plated very well and smooth in every wearing place whatsoever: As for the pitch both in breadth and depth, that must be resolved both from the height you make your Plough, if high in the chest, your pitch must be the deeper about eleven or twelve inches, or about ten or eleven and a half; if to go single you must pitch it broader, if to go double narrower: Every common Plough-wright can help you here, & also understand what is here directed; my irons kept both hard and sharp in points and Phin, and this plough being once well scoured and clean, if it go not with as much ease as nature doth admit, or Art hath hitherto discovered, I will acknowledgemy mistake; but what strength may draw

The benefit of
a broad and
short Wrest.

draw it I shall not determine, I have told you what hath & doth draw the other ploughs before described, and could you shew me all the Lands, and all the temperatures at all seasons of those Lands, I could easily demonstrate that, but to me it is sufficient if that I have both rationally and experimentally discovered to thee the best plough & easiest that I know or have read of in the world, as I have cordially done, and given thee the product of my experience, and from each removed the inconvenience, and drawn out the quintessence as I am able. If this plough be preserved from any earth cleaving at all to it, bee as little in compass as any, have the advantages of sharp irons, and perfect true Workmanship, as that it need no Wheel which is a weight, and requires strength, and is of no use but to guide the Pitch, and this Pitch be made so true of it self as it will goe without it, and the Wreist cut shorter which gives much ease, and makes the plough go more certain, and the furrow turn better, and all these are as an addition to it; I conceive and know less strength will draw it; to which if you please you may add the Dutch Coulter, it going somewhat easier, and is best for the pure turf without stones, but the other being kept as sharp is more certain, and not subject to be cast out of the ground, and will do exceeding well in wrought tillable land, if you keepe it a little before the share, that it may cut first, and one thought wider also but never within the share: 'Tis true in irregular extreme land either for stones, roots, or hardness, I am at a loss, and for that end advise to the double-wheeled plough, which though it will be no otherwise advantaged to ease than as it is well and compleatly made, yet it is for strength & to supply extremities and cases of necessity without rule.

But thus much I will say, that take or make me such a plough, as fore said described, upon any of the aforesaid lands, where the easiest and best ploughs are used (which I could wish had bin before now discovered which would have saved me this labour) and make tryall of it, and as the land is lighter and easier so make the plough lighter and lesser, and if it go not easier by a considerable part, my judgement fail

fails me; I am sure these particulars considered, and solidly put in practice throughout this Nation, may very well save one third part of the charge and toyle of Horse and man; nay in some parts I am confident neare one halfe, and if to the best plough it will give but the least addition, it is satisfaction enough to me; but I very well know, it will save one horse in four, and I believe one in three, as most Countries use, and one man in two. All that I have said is but to the pitch, and making the body of the plough. I say againe, if any contend for wheel or foot, he need but give his plough a little deeper pitch, and he may adde either thereunto, as well as to any other, and please himself. The description of it shal follow in the end of the 33 Chapter.

What ease and advantage this plough and the directions will afford.

And if you object, what shal guide the plough for depth, and keep it from stinging in clay ground, and how may you let it up and down as the nature of your land requires.

To which I answer, that having both in your plough, and plough-irons brought your plough to a true and perfect pitch, it wil require but litle help herein, yet hereby you may much answer your desire in two particulars.

1 In your hindmost gears you may at your chain that is put upon your plough-cock, or clevies, which ought to be made short linked on purpose to take up or let down as you see occasion.

2 Your hindmost, or Fil-horse at the back-band, which may be to take up or let down, you may ease your self at pleasure; and so I descend to the last General head.

CHAP. XXXII.

Contains the Applicatory part of Ploughs use, wherein I shall endeavour to hold forth to what sort of Land, and to what seasons or Tiltbs of Land each Plough is or may be most serviceable.



In the description whereof I shall in generall say, that when lands come to that extremity of hardness as the plough is forced beyond its gage or pitch of truth, and that nothing but force will overcome it, then we must be content to lay by our hopes of ease and all our ploughs whatsoever that were made upon that account; for it is concluded that all good Husbards will take their seasons, which seasons are chiefly for all their Summers crops, in Winter when the Land is moyst & workable, from *November* untill *March*, and for all Winter crops the foundation of that work is to be laid in Winter, as in the end of *December* and *January* to fallow as wee call it, al our strong coarse lay Turf, when wee may work it wel and clear it up to the bottom, which being once wel ploughed in a right season, it will work reasonable well in the hardest season the next plowing, and so very well the next, and so throughout, when it is compleatly plowed at the first; which first opportunity if it be overpassed by too much business or sloth or otherwise makes all the rest of our Tiltbs uncomfortable; every common Husbandman knows these things.

And for this Tiltb, or season of plowing, and these sorts of Lands especially being very rough, hilly or banky, your Wheeled-ploughs will not work, but will be cast out by e-
very

The season of
plowing for
summer corn

The season for
plowing for
winter corn.

every hill-for this use I shall advise you to the plain plough made a little stronger than ordinary, with a true pitch both for breadth and depth, and because both wheel and foot too will cast it out at every hill, and some men cannot hold a plough without either; and possibly thy land may be uncertain Land, that is, some clay, and some sand, and some mould, each of which will alter the going of the plough, therefore in this case let an iron foot be made, with a sharp edge like a Coulter forward to the bottom of the shank, & the foot made flattish, and very thin at both edges, and a little stronger in the middle, rising like a Place fish, and no thicker, and that will cut your hills before your Coulter, and keep it out of the ground too from stinging or drawing into the clayes; but yet a good Plough-holder with a good Plough, will cast this away also in the roughest lands, and meerly with this hinder chain, & backband of his hindmost horse take it up at pleasure, and even play with it too in the strongest workable work, when another shall moyl himself like a Beast, as we say.

A foot described as will go in hilly ground,

But to hasten, when by a drought you are out of work, then I say as afore, that with strength your wheeled-plough will doe exceeding well, and none like it, your double wheeled one I mean, and your single wheeled ploughs too being exceeding strongly made, will tear up any reasonable ground, but in regard the wheel goes but upon an Axeltree, and that is fixed but in one end, in the false beam end also, it cannot be so strong as the other by far, therefore I advise every good Husband to one of these, the body of whose plough may be made to the same advantages heretofore prescribed.

As for the casting down a land, or plowing any flat land, almost any plough will doe well, and so your broad-breasted ploughs will turn over a great furrow; though your Shield-board have little compass; but as to the setting up a Land, or ridging it, as most call it, I would have a narrow breasted plough, with an exceeding whelming compassed Shield-board, increasing both in the breast by small degrees, and in the compass of the Shield-board with a very broad

A plow to cast down land.

A plow to set up land.

and short Wrest, which adds one or two degrees of cast or compass to the Shield board; for in this work you will most apparently see the ease and advantage thereof

The particular use of many of the members of the well regulated plough.

The Coulter having first done his office by going before, and dividing out the furrow.

The Share his, in cutting it up clear, and raising it from the solid Land.

The breast of the Shield-board takes it and gives it a cast and turn, that it is ready to fall.

The Wrest keeps its furrows breadth (for the horses easier going) and not suffer the furrow to drop short of its true place, but least it should stand an edge.

The Heel, or hinder end of the Shield-board comes, being longer than the Wrest, and standing as it were overlooking to see what it will leave, and like a Ladies tryal, gives the Furrow a sweep, or a good check, and bids it lye there in its proper place and not stand upon the edge.

And thus each member having done his office, one taking it from another regularly must needs admit of the greatest ease. A Saddle-tree is made of many peeces, and some compass one way and some another but all to the true compass and easiness of the horse-back, so a plough it might be made of fewer parts and lesser compass, but that fewer will not give the true compass or cast of it, and deliver his furrow upon the best advantage.

As for your ordinary seasons of plowing your Land being in good Tillage, any well ordered, and truly compassed plough will do, you may help your self sufficiently in the making of your irons, if you would have the edge of your lying furrow lye up higher, which will yeeld most mould, then set your Share-phin the shallower, and set your plough the broader, and hold it the more ashore, the Plough-man going upon the Land, and it will lay it with a sharp edge, which is a gallant posture for almost any Land, especially for the lay Turf beyond compare.

How to plow as your lay your land most level.

But if you would have you land lie most even and flat, then set the Phin of your Share deeper, or holding, as some call it, & set your plough the narrower, & the holder alway going

always going in the furrow, and the Shield-board end will so humble it, as you may lay it upon a leuell; this is best for land of which you will make a fallow, or cut and burn the Turf, or for land you intend to lay flat to graze. If the furrow should be all at once turned at the very breast, then it would go just as if you would put a Mold to root with her breech forward; which plough I have seen, but how the furrow would lie I know not, nor well what strength to draw it; but then there need neither be use of the hinder part of the Shield-board, nor Wrest neither; or if you would have it cast all in the Shield-board as some do that make no Wrest at all, then it will either not clear up the furrow well, set the furrow upon an edge, or else the hinder end of the shield board, must whelm beyond all president or rule; or if you would have it made so thin in the breast as to cut through like a knife, and turn nothing till it come to the midst of the Shield-board and end of the Wrest and Shield-board, then there it gives too sudden a check too, and causeth the earth to choak and murther upon the Breast board, that it will not slip away with ease; so that as I said before a medium in all, each member doing its particular office, preserves the health and comfort of the body.

These things (and many more which might be necessary, I will forbear to speak to) are accounted niceties among many, the knowledge whereof hath cost me much, and therefore am able to affirm that the very mystery of Ploughmanship lyeth upon the knowledge and practice of them, and so I proceed to the double plough, and the description thereof.

CHAP. XXXIII.

Holds forth a description of a double Plough carrying two Furrows at once, and both proportionable to a Furrow one ordinary plough shall carry: With a plow that shall both plough and Harrow both at the same time; and how to make a plough last a dozen years.



He double plough shall be as plain as may be, it shall consist of one long Beam of an ordinary length, and another short one, little above half the length of the other. The first plough may be made up compleat in all the members thereof according to the last preceding description of the plain plough; except the handles which may be very short, only so long as may receive the Beam with the Land-handle, and place the Shield-board on the furrow side, which may be done without any but a round staff from the Beam to the Shield-board; which handles excepted; it is one compleat plough in all particulars. The hinder end of the Beam is to be left a little stronger, because of fastening the other beam firmly thereunto; and then I proceed to the making of the hindermost Plough, which must be made in all the members and branches like the other, except the beam cutt off about three inches before the Coulter-hole, and the handles of this at length and strength as an ordinary strong plough is made, just according to the pattern of the plain plough.

Which being done, and the handles upon the last plough, you must see to the placing of it in his place which I discover thus, the first plough standing in its working posture, the other plough with its handles to it to be affixed on the nearer

nearer side, or left-hand, one furrow breadth wider than the other, just in the very same posture both for depth and breadth as the other doth, and so held off: from the first ploughs beam by alining, or filling, of wood just that substance as may continue it firm and fast to a just furrow, and there drawn close and firm to that Master-beam with two small iron boults, and a broad float or two of wood, all which may be so keyed and cramped up, that it may be as one solid beam, and so move as the first moves, either for height or depth, which it must needs do, and this I conceive may be best used with a plough-foot to guide the depth of it, unless you place a wheel to that foremost beam, but not in a false beam, because I have not experience of applying this doubleness to those deep pitched ploughs, but in the end of that beam you may have as good a mortels as your beam will bear, which is the mortels for the foot, and therein you may place a square good strong piece of tough Ash, or rather of iron, into which you may have your iron Axle-tree with its square end fitted into three or four severall holes of it, by which means you may set your plough at a working gage, and there continue it, and alter it as you see cause; which plough thus marshalled, you may well plow upon ordinary errable land that is in good tillage a double proportion, and also upon fair clean lay Turf, and this you may manage with two men and four good horses, but not either upon stony land, or rough land, the description and discourse wherof I give not in as of any great advantage above the other plain plough, but for variety sake, and to provoke others to the amendment and perfecting of this discovery; yet I for present see not, but it may be of excellent use & expedition upon many lands in *England*, and to say much more is needless, in regard of what hath been before spoken and experience of a good ploughman will order it at pleasure.

And so I shall only discover one other plough that will both plow and harrow of it self at one and the same time, and it is used in severall places in *Norfolk*, yet casting about with my self the advantages and disadvantages also, and

How to set the double plough together.

The plough with a harrow affixed.

and finding not how it will so well suit with our common wayes of Husbandry as to be a general advantage, I shall say the less, only tell you the manner of it, It is a common light Plough as all theirs are, and as little and light a Harrow, which may contain three little Buls, & about five Times in a bull, which is made light also, and fixed to the plough at the one end of the beame, so that as the plough turns this turns also, and as the plough turns one furrow, the harrow harrows it over, reaching two more furrows, and so by the over-reaching it strikes two or three times in one place, which is sufficient for the covering any corn whatsoever shal be sowed upon *Norfolk* lands; but finding these two prejudices against it, *viz.* either this land must be sowed as the land is plowed, & so it will take up a mans time sowing an Acre, when otherwise a man will sow nine or ten Acres in one day, or else it must be sowed before plowing, and then it must be plowed in, and harrowed upon the top of it, which falls not under my experience, having known much land fall far the heavier and more subject to bind and bury, than if onely lightly covered with the plough, and laid more open; and now thou hast the story, that such a thing is; and may be done, may thy own experience be the determiner of the matter, but after the writing hereof having communicated thus much to a Gentleman of art and worth, do find that another addition may be made thereto, which is how to drop the corn, corn by corn proportionably to that quantity I desire to sow upon an Acre, which if by his assistance I can experimentally make out, I fear not to give you plough, and harrow, and seedsmen all at once, and all to work with two horses and one man upon some lands, and with three horses upon all of this nature, & al to be done almost within the same compass of time that you are upon the plowing of it, it shall not require one hour in the day more; wch if I shal accomplish, you shall save near three parts of your seed also, and a considerable peece of labour too and not fail to have a better crop through the blessing of him that waters all, than ordinary wise. All which I hope to have brought into substantiall experience upon my own lands

P'ough-har-
row, seedsmen,
and all in one
plough & work
all at one time.

lands by the next edition, and then expect the faithfull communication thereof. One word more which would have come in more seasonable about the description of the plain plough, and that is how to make a plough that may last many years ten or twelve, or fifteen years, yea I heard a workman affirm he would make one should last twenty years: As for the manner of the plow it is sufficiently spoken to already, all lyeth in two things: one thing is the wood it is to be made of, and the other is the workmanship of it.

The wood, especiall of the Sheath and plough-head, which is the materiall fundamentall peece in the Plough, must be made of heart of Oak, which to me at first seemed strange, but upon a full debate of the matter I find that if it be young tough Oak, & wrought so exact true in the joynts as may be, & kept so close boarded up as that water cannot get into any of them, and laid away dry, and so kept, but while in working, and every part of it well clouted & plated with iron, and drawn close in the throat from a hole in the Share, through the Head & part of the Breast-board with a through iron pin which is to be wrought somewhat bigger under the head, that so it may somewhat strain the share to a more perfect closure, and stronger sticking to the head and wel cotted up through the beam, being bored with a long shanked Auger through al: And al the rest of the wood to be young white tough Ash, and wrought compleat and true in every joynt, & laid up when out of use, both out of wind & weather, & out of question a good plough may well serve a mans uncertain life: and so having as I hope, in some good measure supplied that deficiency in Husbandry Mr. Hartlips Legacy chargeth us withall in the fifth page of his Book, and so proceed to the next peece of Improvement.

The lasting
plough that
may endure
many yeares.

I i

THE

*The Third Peece of Improvement
treats of Welde, Woade, and Mad-
der, three rich commodities for the
Dyars.*

CHAP. XXXIII

*Onely holds forth Welde, or Would, as
some call it, or more properly
Dyars-weed.*

Welde descri-
bed.



It being a rich Dyars commodity, beareth a long, narrow, greenish, yellow leaf, and bringeth forth a yellow flower, which runs to a small seed far smaller than a Mustard seed, very thick set with seed; *Pliny* calles it *Lues*, but *Virgill* calls it *Lutum*, and in our English Welde or Dyars-Weed. It flourisheth in *June* and *July*; it in many places groweth of itself, in, and about villages and towns, and is of a very great use, and considering the easie charge of the raising of it, and the badness of the land upon which it will grow is of incomparable advantage.

For first it will grow of very indifferent land, not worth above ten groats or half a Crown per Acre; yea as some affirm, the veryest hilly, barren, chalky, light land, not worth twelve pence per Acre will carry it, and bear it to very good purpose, but unto so barren lands I shall not give encouragement, unless where there is little or none better; but as any indifferent land, so it be of a very dry, warm nature, it will do very well.

The manner of
sowing it at no
cost.

And secondly, it will cost but a little the managing, it requires no tillage at all, no harrowing, it being to be sowed

sowed when and where you sow your Barley or oats upon that Husbandry without any other addition, unless you draw a bush over it, or a role, either of which is sufficient to cover it after you have sowed it, the difficultest peece in the managing hereof is the very sowing of it, that is, that it may be sowed even; for the seed being so very small will require both skill and an even hand to scatter it; some sow it by taking it with one finger and the thumb, others with the two fore-fingers and the thumb, but neither of these do I affect the best way, because they cannot spread it so well as they may with their whole hand; I therefore prescribe a mixture with Ashes, Lime, fine earth or some such thing as will best suit with the weight of the seed; for could you find out that, that agreed both in weight and bigness, then out of all question none to that to sow it withall.

A gallon of this seed will sow an Acre, which had need How much
to every quart of seed have two gallous of some of the afore- soweth an acre
said, and it must be often stirred together lest that the seed sink to the bottom, and sow that part thicker than the other, and then cast it out at arms end at as good and even compass as you can possibly.

This seed thus sowed may grow up among the Corn, and yet be no prejudice, because it groweth not fast the first Summer; but after the Corn is cut it must be preserved.

And the next Summer you shall receive through Gods blessing a comfortable crop; you must be exceedingly curious of the ripening of it, if you let it grow too long, your seed will fall out, if not long enough, your seed will not be perfect, nor your stalk neither; and therefore observe both the turning of the seed, and the ripening of the stalk; for I cannot tel you which of either will admit of a dispensation, and as soon as ever you perceive it near up to perfect ripeness, you must down with it, that is, pull it as you do Flax up by the roots, and bind it in little handbuls, and set it up to dry in little stiches or stiche, untill both seed and stalk be both dry, and then carried away carefully as that the seed be not lost, and laid up dry, and so keep as you see cause for a good

When ripe.

How to use it: market; for it is to be sold for the Dyars use, who sometimes will give a very good price, but at all times sufficient profit; and go far to buy it, from forty shillings an Acre, to ten or twelve pound an Acre, some say more. And you may burn it up, and keep it and the seed together untill March and then you may get out this seed by lashing or whipping of it forth upon a board or door, which reserve for seed; the seed is of good value, sometimes worth twenty shillings a bushell, and sometime ten shillings a bushell, and sometimes more or less as markets rise and fall.

It coloureth the bright yellow and the Lemon colour; The stalk and root are both useful, and must go together to the Dyar.

What Improvement
welde yeilde h

And if this Weed prosper well, as questionless it will after you be got into good seed, this will make good my promise, if it prove worth but forty shillings per Acre, the land being not worth above five shillings or six shillings & eight pence as either of these will do exceeding well, the charges of sowing, and all things till you come to pulling it, is not above one shilling per Acre; the pulling, whipping and burning may come to four shillings more; the seed may be worth half a crown, so that all charges and rent of the land may amount unto less, but I will say fifteen shillings, then the Improvement will be fourfold if worth four pound ten shillings an Acre, sixfold, if worth six pound per acre, eightfold, and much more as some affirm to sixteenfold Improvement.

This Land though it lie far from Towns, Cities, yea in your remotest Countries may be brought to this height of Improvement, and it begins much to spread and thrives very well in *Kent* in many parts of it; the best place for to get the seed is in *Kent* clean down to *Canterbury* and *Wy*, where you may see both the land, the growth and discover the mystery thereof. It is sold by weight so much a hundred, and so much a tun weight. It is my desire to make publique whatever comes under my experience, yet this hath been used this many years by many private Gentlemen in divers parts but not discovered for publique practice, but no marvell, for that

that great business of planting Hops, that is one of the famous peeces of our Nation, hath not any thing been wrote near this fourscore years that I can read of, and indeed then was wrote a large discourse thereof but I remember not his name, or else I should have here raised up his memorial, having done exceeding well thereon, but that all this time of so large experience, none should get upon his shoulders, and a little add to his beginnings, is the unthankfulness and shame of your great Hop-masters. I fear mens spirits are strangely private that have made excellent experiments, and yet will not communicate; surely me-thinks plenty and publique usefulness should not be so much feared as rejoyced in. And so I hope in this I have in some measure supplied my promise.

CHAP. XXXV.

*Treats of Woad, the Land best for it,
the usage of it, and advantages
thereby*



Woad it is also a great commodity, it layes the foundation for the solidity of very many colours more: A Woaded colour is free from stayning, & excellent for holding its colour; almost any sad holding color must be Woaded. It hath been one of the greatest enrichments to the masters thereof, untill the midst of our late Wars, of any fruit the land did bear. It is called *Glastum* or Garden-woad, by the Italians called *Gudo*, in Spanish and in French *Pastell*, in Dutch *Wer*, and in English Woad or Wade. It hath flat long leaves like *Beben rubrum*, the stalk is small and tender, the leaves are of a blewish green colour. The seed is likest to an Ash-key or seed, but not so long; like little blackish tongues. The root is white and simple. It is a very choyce seed to grow and thrive well; it beareth a yellow flower,

The best Land
for Woad.

and requires very rich land, and very sound and warm, so that very warm earth, either a little gravellish or sandish will doe exceeding well, but the purer warmer solid earth is best: Land exceeding rich, and though it should be mixed with a little clay will do well, but it must be very warm. There is not much land fit for this design in many Countries, especially your hardest Wood-land parts you have in many of your great, deep, rich pastures, many hills and hill sides good Woad-ground, when the bottom ground will doe no service but your chiefe is your home-corse, or lesser ground lying near and bordering about the towns.

Best known
parts for
Woad.

Your best and naturallest parts of *England* for Woad, are some part of *Worcestershire*, and *Warwickshire* Southward, *Oxfordshire*, *Gloucestershire*, *Northamptonshire*, *Leicestershire*, some part of *Rutland*, *Bedfordshire*, and *Buckinghamshire*, and some other places here and there, all these parts have some admirable Woad-land in them.

But when it is a quick commodity, as now it is dull, they will find as much more land as now they will, and then more indifferent, dry, sound, warm land will serve, but very dry and sound it must be, and worth about twenty shillings an Acre to graze at least, or else it will not bee worth the Woading.

What price
men will give
for good
Woad-land.

And to plow to sow Woad it may be worth as much more as to graze, yea somewhat more if it be extraordinary rich soyl, and trading good, but now as the seasons are, and trading stands, they will now make great orts of land, and not bid any money for that which in good trading times they would have gone fifty miles to have took at great rates.

And whereas some write that it undoth the land, I answer as I judge in my own breast, that in regard it is so often cut and groweth so thick, and is so often weeding, that it must needs do so, as I beleieve al Corn doth draw forth some of the spirit therof, but no more than other Grain would if it could be so oft cut up to grow again.

But it is the confidence of many Woad-men that will maintain against any man that it better the land and mends it,

it, but to that I cannot accord neither, but thus much I doe say, it prepares the Land exceedingly for corn, and doth abate the strength and superrichness, or rankness thereof, which corn would not wel endure, for I maintain still that the richest Land is not best to corn, for though the one may ouer-burthen and be so rank, yet the other may bear as much to the strike, and for goodness your middle Land beareth the bell away for corn in my opinion.

Woad prepares exceedingly well for Corn,

The best Corn.

Very much may be spoke to this particlar, but I must shorten, and will as much as may be, and acquaint you with the use thereof. And herein I must do these three or four things.

1. Shew you how the Land must be prepared and sowed.

2. Shew you how it must be ordered, when the leaf must be cut, and how ordered after cutting.

3. And lastly, how it must be tempered and seasoned to make the best Woad for use and profit; but before I proceed I must inform my Reader that this commodity can not be played withall, as you may doe with Liquorish, and Saffron, &c. to make experiments of a little parcell, but a man must of necessity set forth, and forward so much stock and Land, and seed, as may keep one Mill or two at work to make it into perfect Woad; It is the doing of a great quantity, and carrying on a great stock that makes this work, and will carry it on to profit and credit: Some have as much underhand, and will work six or eight Mills. The charge of it is exceeding great in the managment of it, and as well it payeth for all charges as any commodity I know of, that is of old experience.

The ground must be old Land as aforesaid, and a tender Turf and must be exceeding choicely plowed, if very hilly they must be cast, and well cast, that that you cast forth lie not high to raise the furrow, they usually plow outward or cast all their Lands at the first Plowing, and having broke the ground with a Harrow, then they

How plough-

ed.

How much
soweth an
Acre.

they sow it, and sow about four bushels or strikes of an acre, which done, then cover it, and harrow it very well and fine, and pick of all the Clots, Turvees and stones, and lay in the hollow places of the ridge on heapes as is the usuall custom, but now I should rather (if there be no other reason than I conceive) chuse to take a little Cart with one horse, and as the boyes or children pick them up, cast them into the Cart, and carry them into some flank or hollow place and lay them down to rot, or else mend some barren place, because they lose a good considerable part of Land, and so of Oad too, which otherwise might be as good as the rest, and is now worth nothing; the Land that is lost is very considerable in regard it is so good of it self, and the stock so good and rich that is sowed upon it, that all even ground had need be regained that possibly may be. And so I descend to the second particular.

2. Which is to shew how it is to be husbandried, and when the leaf must be cut, and how used, and how oft,

What it costs
an Acre weeding.

After the Land is sowed and it begins to come up, as soon as any weed appears it must be weeded, yea may be twice weeded or more if it require before it be ready to cut, but if it be speciall good, and come thick and cover the ground well, it will ask the less weeding; to them that are exercised in this service, and have their work and work folks at command, they will have it weeded for eight pence an acre, and sometime less: as soon as the leaf is come to its full growth, which will be sometime sooner, sometime later, as the year is dryer or moister, more fruitfull or less, which when you perceive at the full ripeness set to cutting of it.

As soon as ever it is cut, your Mills being prepared; and great broad fleakes so many as may receive one Crop prepared, and planted upon galleries or stories made with poles, Fir, alder, or other wood whatsoever; your Mill is usually known, a large Wheel both in height, and breadth, and weigh doth the best, it is a double wheel, and the
Tooth

Tooth or ribs that cut the Woad, are placed from one side of the Wheel to the other very thick, wrought sharp and keen at the Edge, and as soon as the Woad is cut and comes out of the field, it is to be put into the Mill, and ground one kilnfull after another as fast as may be; the joyce of the leaf must be preserved in it and not lost by any means, and when it is ground it is to be made in balls round, about the bigness of a ball without any composition at all, and then presently laid one by one upon the fleake to dry, and as soon as dried, which will be sooner or later as the season is, they are to be taken down, and laid together, and more put in their places; but because all Circumstances will be too tedious to discourse, & the work is a common work and very many well versed therein, I will rather advise my Reader to get a workman from the Woad-works which can carry it on artificially, then venture the experimenting of so great a work upon words and rules, and therefore I shall be very brief, and let you know that good Woad may yield in a very good year five or possibly six crops, yea ordinarily four and yet sometimes but three, but the Winter crop is of good worth, excellent for sheep, conceived good against the rot, or will recover a rotten sheep, and also it will maintain them well, and though at first they will not much affect it yet with a little patience in holding them thereto, they will take to it most perfectly and that with love, and it will continue them in good heart, & strength, till sowing time again. The time of sowing is in the middle and end of *March*.

The joyce of the Woad must by carefully preserved.

Five or six Crops in one year of Woad.

Season for sowing Woad.

And thus when you have cut all your crops one after another till the Autumn or declining season will not ripen it again, and your mill is at leisure, then you must proceed to the third particular.

Which is to the ordering and seasoning of it, and working it up to use, which must be done the manner following, you must set your mills to work again, to grind it all over again, and then season it up, and so you may make it stronger and weaker as you see occasion.

K k

There

There is so much difference betwixt Woad and Woad, that the Buyers though so experimentall will hardly buy you any parcell untill they have experimented it in Colouing; And therefore for me to prescribe a Rule upon such uncertainties I hold it not safe: The Woad-man will make you up three or four sorts of Woad, according as he intends to friend a Customer.

A word or two more, as to the seasoning of Woad, and but very few, because the very first years tryall will put you into sufficient experience. As the Woad yeelds many Crops, so each Crop is worse than other, the first Crop is best, and the second next, and the third much worse, and the fourth far worse than that, & the fifth worst of all; if you get a fifth but that is not usuall, four Crops is sufficient, & sometime you must be content with three, & as the first Crop is usually (in a good kind year) ripe by the midd^l of *June*, so will the second be usually ripe within one month after that, and so every month or thereabouts each Crop will be ready, & if the latter end of the year prove kind, then you may expect a Crop the more.

When Woad
is ripe.

Now to know when the Woad is ripe, and to take it in the very season, is a fundamentall peece, which is when the leaf is come to a full growth, and retaines its perfect color and lively greenness, then with all your might set so many hands to cutting of it, as that it begin not to fade or wax pale or wan before you have cut your crop, for then it begins to be over-ripe, and the sap and marrow of it drinks in again and will not yeeld store of juyce, which is the spirit of it and best of Woad.

The Woad-man seasons the two first Crops together, & some season the third by it self, and the fourth by it self, and some put the three first Crops together, which makes the worser Woad, but the very virgin Woad is the first & second, and the better they desire to make it, the more future they compound it, not confounding it with divers sorts.

The best
Woad for use.

The manner of seasoning is thus, after every crop is cut, & grinded, balled and dried, as dry as can possibly, and laid

up

up in the ball every crop by it self, then you must take the first & second Crops and grind them all over again together, or apart if you please, but they must be then wrought to dust as it were in the mill, & ground very well the first & second Crop, or so much as you will make of your best sort of Woad, and so laid upon a floor in a heat or couch, and then you must mix it with water, and turn it over, and so mix it again, and turn it over, and give it so much water as that it be all soaked thoroughly, however you may oversoke & drown it, and that is very prejudicial to it, it must be turned in the couch every day once for three or four weeks together, and then every other day once for about a fortnight, and then twice a week till it be come to a right temper; at the first many men must be employed, carrying water as hard as they can till it be all of it wet & well soaked, and that you may know the better how to temper it a right, you shall find it heat exceedingly in the couch, which you must look to keep in a moderate condition; which overheating you may prevent with turning, that it overheat not by any means, it may grow so hot as you can possibly abide your hand in it, but not to exceed that heat, & how to know its seasons kindly, & so will in time come to perfect rich Woad you must observe that it will alter and change divers times, first it will mould, hoar & frost, and smell exceeding strong; then it will in a little time abate thereof and grow toward a black colour, and then it will hoar or mould again, and change a little whitish, and after this second change it will come to a perfect black, which the brighter & clearer colour the better; This must be the winters work, and it will be good for cold weather, and when it is thus wrought & comes to its colour, then you may lay it up, or heap it up, to lye for a sale, putting divers poles into each heap to the bottom to open it, & keep it cool, & you must be sure it take not heat again; and thus all your sorts of Woad must be seasoned one after another, & especially all such as you can dry that summer, but to tell you how to know or chose the best Woad is scarce in the power of the Woad-man, who can but guess at it from that ex-

The way of
seasoning
Woad.

How hot the
Woad arise
on in the
couch.

perience he hath in the mixing of it, but it must be tryed by the dyer, who usually wil before they buy any quantity.

And therefore I shall advise thee rather to get an ingenious workman at the seasoning of it, who with that judgement he hath, and the experiences, he is now in capacity to make, he may season it to all occasions and interests whatsoever, and so I come to the advantages thereof which are very great.

The advantage
of VVoad.

And first it is nationall, in that it sets many poor on work, is the staple and chief of the Dyers Trade, layeth a foundation for all holding colours, and much advanceth land in the Rent, it doubles or more, and in the usage of it upon this husbandry trebleth or quadrupleth it, and many times more: and then secondly it is personally advantageous, the best Estates that hath been got in all our rich upland Countries have been got by it, at some seasons, and when they have a right Crop and good markets, it will amount unto as much more: it hath been sold from twenty pound the best Woad to thirty pound, and back again from thirty pound and twenty six pound down to six pound a Tun.

CHAP. XXXVI.

Which discovers the nature, use, and advantage of Madder.



And so I shall descend to my third Dyers commodity in relation to Dying or Colouring, and that is to the story of Madder that colours the rich and best solid Red, the which if I can so mannage as to bring it unto the same progress as Oad is brought unto in *England*, I mean that

that whereas (though very rarely it is now planted in some gardens, and in some small plots of ground, and doth amount unto a very great advantage to the Planter, by the sets they sell forth, and by the roots they draw to vent to the Apothecary; and medicinably to others, and yet so make a most excellling value of their Lands, indeed beyond credence, some have made as I have been most credibly informed after the rate of three hundred pounds an Acre in three years, for so long it grows before it come unto perfection, and others that have sold it whole-sale a parcell together at the worst advantage after one hundred and sixty pounds *per* Acre, and some have out of small plots in gardens made more than I have or will here affirm, and however, though I shall be so modest as to confess that much of your garden stuff may yeeld with the cost and labour that is continually applied thereto, as much or more than here is spoken of as I am confident. I could name divers things which some preserve as rich Treasure in their brains and will not discover them, yet this I shall affirm, that this being a fundamentall fruit, and such a one as that the plenty thereof will not much abate the market, Our dying trade being supplied herewith from beyond the Seas, that the Erection of such a Plantation as may bring it forth wrought up and fitted to the dyars use, and so be a supply to our selves within our selves, I am confident is a design of incomparable good, to the Common-Wealth especially, it imploying so many hands as will be to bring it to perfection: It is like to prove a staple commodity, and will turn land to as great an advance as any seed or root that it is capeable to receive, and need no more fear want of markets for the venting of it, than wee need for wooll that staple commodity of the Nation. And because the discovery thereof is a matter of so great Importance, I shall spend a little more time in the discovery of the whole frame hereof.

what it yeelds
an Acre.

And I shall proceed to the description of it.

There is bute on kind of Madder which is manured and

The description
of Madder.

set for use, but there is many things like thereto, as Goose-grass, soft Cliver, Ladies Bedshaw, Woodroof and Croswort, all which are like to Madder leaves, and are thought to be a wild kinds thereof; It hath long stalks or trayling branches disperfed upon the ground; rough and full of joynts, and every joint set with green rough leaves in manner of a Star. The flowers grow at top of the branches, of a faint yellow colour, after which comes the seed, round and green. The root creepeth far abroad within the upper crust of the Earth, intangling one root into another, and when it is green and fresh, the root is of a reddish colour, it is small and tender, but gathers and runs in the ground just like an Ivy along a House or Tree. It is a commodity of much value Patentes strove hard for it, and Patents were gained about it in the late Kings daies, and yet now in these times of freedom who pursues it?

For the making out a good Plantation hereof, I must do these three or four things.

1. Shew you what it comes of, and how to plant it and preserve it.
2. How to get it and use it, to bring it to saleable Madder.
3. The benefit and advantage nationall and personall.

Although it bear a seed, yet that seed comes not to perfection here, it is therefore to be planted of the sets that are to be gotten from the Madder it self, and they are be bought in many gardens in *London*, who keep up that Plantation for the advantage of selling their sets and roots Physically to the Apothecaries onely, all the skill is to distinguish of the goodnes thereof: And for the discovery thereof, first know the season of getting or rather drawing them, which is in *March* and *April*, yea as soon as they are sprung forth of the ground two or three inches long, then you must be carefull you get sets rooted; Every set having some suckors or spinies of root going out from them, they must be slipped from the main root,

The seasons
of drawing the
sets.

root, and these sets as soon as ever took up, put into some basket with a little mould, and posted to the place where they are to be set, the sooner the better; and then your ground being very rich it cannot be too rich for this commodity, however it must be a warm and very deep soil, and digged two or three spade graft depth, and two shovellings also, and raked and laid even and levell, and then by streight lines trode out into long beds about four foot broad from one end of your work into the other, and set about one foot asunder every way, and if it be a dry spring they must be kept with watering untill they recover their fading wan condition; you may begin to dig your ground in the beginning, so all along Winter till the very day of setting, and then you must keep it with weeding and hoing till it have got the mastership of the weeds and then it being a weed of it self wil destroy all other.

What ground is best, and how to prepare it.

One rod of ground is worth seaven pence a rod digging, or if very dry strong ground, eight pence, but six pence the best ground will require, and you may sow some early salliet Herbs, or Reddish, or Onions; or such things as will be ripe betimes, among it; the first year good weeding is the best preservative unto it, and in your setting of them by a line, one goes before and layeth every set in his place, and another comes and with a broad dibble made for purpose, thrust down deep, and open a hole, and put in the set; and for the nourishing of it, in case any dye you must plant new in the room of what decays, for the time of the growing of it untill it come to perfection is three yeares, the first yeare you may take off some few sets here and there; but that is somewhat dangerous, but that year it must be kept with hoing a while also, and then the second year you may take up sets as fast as you will, and almost as many as you wil, leaving but as you do in the troping of an Oak one bough for the drawing up the sap out of the root being so thick and strong in the ground that nothing will decay it almost; if thou hast but a reasonable quantity, then

A rod of ground what worth setting.

At what distance and how to set them.

When to get sets of our own planting.

then thou must get it for the use of the druggsters and Apothecaries, and the sets to plant again, and then in the taking up of every root there will be one runner which hath little buds upon it, the which may be divided and cut into a fingers length, each so planted with one bud out of the ground set upright, which makes very excellent good sets, one runner will make many sets, but these sets cannot be got up untill the Madder be taken away: And having thus preserved it untill it come to a good crop, if thou intendest it, and hast a quantity sufficient to set up a Madder Mill; having curiously dried it as you do your hopps to a just & perfect gage of drought; Thou must provide all materials to that purpose; the Mill I cannot well describe, and it is exceeding curious to be made aright, & I do not hear of any one can do it, yet possibly there may be some Engineer or some Dutch man here that can do it; it being a common Mill in *Holland* and the Low-Countries, which is the only place for Madder that I hear of in the World. A rude discovery I could give, but I wil forbear least any one taking pattern by it should abuse himself more and me in some measure, yet here is the mystery of it; so to pare of the husk that it may be if possible as the wheat is ground beflaked or flayed that it may go all one way, which sort they call the mull Madder and is little worth, not above nine or ten shillings a hundred; and then you must take out the second sort called the number O, which is the middle rind, and is not worth so much as the third sort called the Crop madder, by one sixth part. and this crop Madder is the very heart and pitch of it inclining to the yellow, and this lesser in quantity but better in quality by far. Sometimes the best Madder is worth eight or nine pound a hundred, and the number O is worth but six pound six shillings 8 pence or eight pound two shillings six pence, and sometimes, it is not worth above four pound or five pound a hundred, yea sometime it may come to three pound the hundred possibly, because I would not abuse the Reader, I advise my Madder-Planter to send over for a workman

man thence, who can both describe the Engine, and the manner of mixing & sorting of it, which is the greatest mystery, and well worth your labour and pains it will be.

At *Barn-Elms* was once Madder sown & brought to good perfection and a Mill erected by one Mr. *Shipman* the late Kings Gardner, who had a Patent for it from the late King; but being as I am informed, a poor man, was not able to carry it on for want of stock, & as I conceive these times coming on broke his new Plantation but on Mr. *Hassay* bought his Madder, which proved excellent good, and sold it again to the Dyars who exceeding high commend it.

Madder planting formerly granted by Parliament.

Which is sufficient proof to me that we may raise & make as good as any is in the world, & why not as well as *Holland*? our Lands both Marsh, Fen, abundance of Up-land and Meadow is as rich, dry, and deep of soyl and good for it as theirs is, and we have use enough for many thousand weight of it, some Dyars using above a 100 pound a week a man.

The profit I shall not determine, because it will belong before a thorough tryall can be made of it, but now as it is planted in Gardens unspeakable advantages are made thereby, and should it hold that proportion when it comes to be made up and compleated to the Dyars it would prove the richest commodity that I know sowed in *England*.

I hear Sir *Nicholas Crisp* is erecting a Plantation of it, his ingenuity is to be commended highly in many things, & for his publique spiritedness countenanced in a work that is so likely to tend to the publique good. I know none can drive on publique ends without private aims; neither know I well why he should to his own ruin; but he that drives on his private so as the publique shall be most advanced, from men deserves great honor; and thou that repinest, set such another work on foot, and then thou wilt grow more charitable. But I shall say no more, but humbly pray all encouragement may be given hereunto; for could it be brought to that perfection as Woad is here, it might be as great an addition to the nation as any thing I can discover: I have done.

At Dedford by Greenwich is his Plantation.

*The Fourth Peece of Improvement
both respect unto the Plantations of
Hops, Saffron, and Liquorish, both
in relation to the mystery thereof, and
profits thereby.*

CHAP. XXXVII.

*Onely treats of Hops Plantation, and how
Land is improved thereby.*



S for Hops it is grown to a Nationall commodity. But it was not many years since the famous City of *London*. petitioned the Parliament of *England* against two Anusancies, or offensive commodities were likely to come into great use and esteem, and that was *Newcastle-coal*, in regard of their stench, &c. and Hops in regard they would spoyle the tast of drink, and endanger the people, and for some other reasons I do not well remember, but petition they did to suppress them, and had the Parliament been no wiser than they, we had been in a measure pined, and in a greater measure starved, which is just answerable to the Principles of those men that now cry down all devicts or ingenious discoveries, as projects, & so this day thereby stifle, & choak Improvement; yet we see what nationall advantages they have since yeilded and no less will many of the other.

This Hop plantation would require a large discourse, but I shall contract my self to the briefest discovery thereof I can possible, & therefore shall under three or four Heads,

- 1 Shew you the land is best for them, and best Sets to plant withall.
- 2 The manner of planting them and husbandring them untill they be fit for sale.
- 3 The profit and advantage that will accrew thereby.

I shall describe it thus, it comes up with severall sprouts like Sparrowgrass, runs up & climbs on any thing it meets withall, bears long stalk., hairy, and rugged leaves, broad like the Vine, the flowers hang down by cushers, set as it were with scales yellowish, called in high Dutch *Lupulus* in Low Dutch *Hopsem*, and in English Hop. It is offensive upon this score, hot in the first degree, stuffs the head with the smell, therefore use it not too much, yet the leaves open & cleanse.

i The best land is your richest land, and in time you must gain therein, lest another reap the benefit of your labour.

It must be a deep mould, that which lyeth near the Rock, the Poles cannot be set deep enough to stand firm; it would be a mixed earth that is compounded of sand and a little clay, but much solid earth; a strongish land laid dry and warm will bare the most weightiest Hops. Best Hop-land.

A barren, morish wet soyl, is not natural to the Hops delight, but if this be laid very dry and made very rich with dung and soyl, it may do reasonable well.

It will be best to stand warm if may be, preserved from North & East wind, rather by hills than trees, as near your house as may be, & that Land you determine for your Hop-garden, lay as levell & as square as ye can possible, and if it be rough and stiff, it will do well to be sowed with Hemp, Beans or Turnips before; but in what state soever it be, till it in the beginning of Winter with plough or spade, & this not onely the year before, but every year so long as you use it, & the more pains and cost you bestow, the more profit, and the nearer you resemble the *Flemming* in his hopping. How a hop-garden should stand.

And for your Sets, those are your Roots taken from your old hills & roots, go to a garden ordarly kept, where the Hops are of a good kind, all yearly cut, and where the hills are raised very high, for there the roots will be greatest, & buy choice Sets; they may cost six pence a hundred, and sometimes have them for taking up, leaving things orderly and their hill well dressed. Best hop-sets, and where to have them.

You must chuse the biggest roots you can find, such as are three or four inches about; and the Set nine or ten inches,

long, and have three joynts in a root.

Take heed of Wild-hops they are onely discerned by the fruit and stalks.

Signs of an un-
provable hop

The unkindly Hop that likes not his ground, soyl or keeper, comes up green, and small in stalk, thick and rough in leaves like nettles, much bitten with a black fly, but it destroyes not the Hop, but hurteth it somewhat, and so you have the first particular.

2 The manner of planting as soon as your roots are got, either set them speedily or lay them in some puddle, or bury them in earth: but leave them not in water above four and twenty hours.

How to make
the hop-hills.

Then begin to direct your hills with a line, tyed with knots or threads thereto, the due distance had need to be 8 foot betwixt, because then you make the fewer and bigger hills the sun comes about them, the poles reach not one another, and so it may be plowed yearly, otherwise it must be digged some say seven foot, and others say six foot, as our late accustomed manner is, and I am confident there is most advantage by thin planting, but that I leave to each experience.

The very time
to plant in.

Your hole under the knot of your line had need be a foot square and deep, then if you can have the wind South or West it is best, if not, go on having made many holes, matter not the wind: be sure to take the moneth of Arpil for the work, and take two or three of your roots, as a great old Gardiner affirms, which by this will yeeld green Sciences or whit buds, and will have small beards growing out, and joyn your sets together even in the tops and set them altogether bolt upright, and there hold them in their place till you have filled the hole with good mould, & set low, but just as the tops may be level with the ground, and then after they must be covered two inches thick with fine mould; be carefull you set not that end downward which before grew upward, which you know by the bud growing upward, and let no part of the dead stalk remaine upon the uppermost joynt thereof, then press down the earth hard to the roots; some will set them every one at a corner of the hole under the line which I rather encline to, because they have room

and

and stand round; but if you plant late, & have green Springs upon them, then be careful of not covering the Springs; but to set more plants lest some should fail, and in a bigger hole, and round about the same set 8, some say ten or more, which is thought tedious, but I will make a tryal thereof, it being the latest experimented in our dayes; now at this time you need make no hills at all there as aforesaid. Poultry must be preserved from scratting, the Goose especially.

Now for poling, if your distance be 3 yards, or 8 foot, then 4 poles are required, else three will serve, but I encline them, & which poles are best. How to pole them, & which poles are best. to 6 or 7 foot distance, and 4 poles, and as many this year as any. Alder poles are very good, taper and rough, and futable to the Hops desire, but you must take such as the Country will afford.

The time of cutting your poles is in *December* or *November*, and then dress them and pile them up dry; if you leave some twigs it will not do amiss.

For length, 15 foot is a good length, except your ground be very rich, or your hills exceeding heightned, or if they grow too thick, your poles need to be the longer. The Hop never stocketh kindly untill it reach higher than the pole, and returneth a yard or two; for whilst it is climbing, the branches that grow out of the principal stalk grow little or nothing. Your poles be strong, 9 inches about the bottom they stand faster: 150 poles make a load, which may be worth a little more than ordinary wood; a few will supply the standing stock; in setting your poles lay all to each hill you intend to set, which speeds the work. Poles length: The best sort of poling.

When your Hops appear, as you discern where your principal root stands, then set to poling, having a row of Iron to make entrance for the pole; but if you stay longer, then you will be more subject either by ramming or making holes to bruise the root, or else they will not so easily catch the pole without flying. And speediest way.

Your foot of the pole must be set a foot and half deep, and within 2 or three inches of the principal root; but if your land be rocky, then you must help your self by making your hill higher to strengthen your poles, for wch you must stay the longer too lest you bury your Sciences. Your poles of each

And best season.

each

each hill lean them rather outward one from another, and then with a rammer ram them outward and not inward

If a pole should break you take away the broken pole & ty the top of those hops to the top of a new pole, then winding it with the sun a turn or two, set it in the hole; but if you can take a stake and ty it too without wrestling the wires of it may do well to peece; but if broken at the neather end shove the pole in again; and if your poles break in the pulling up, or will not be drawn by reason of drought or hardness, you may make a pair of pinfords of 4 foot long, with an iron runing hook upon them, & with a block laid under upon the top of the hil, & so coleweigh up your poles; the mouth whereof made hollow. And for laying up your

How to draw
broken hop-
poles.

How to lay the
poles.

How to turne
the hops to the
pole.

One of the
main things in
the hop-yard
is raising the
hills.

At first sup-
press not one
science.

poles, the usual way is to ty two & two together in the top, being set in 6 opposite hills, & so raise a little earth betwixt the hills as if they were but three hills, and lay some hop-bands upon the 3 hills under your hop-poles, and so draw your tops nearer together, or further off as you see cause.

When your hops are grown two foot high, bind up with a rush or grass your binds to the poles, as doth not of it self, winding them as oft about the poles as you can, & wind them according to the course of the sun, but not when the dew is upon them: your rushes lying in the sun wil toughē.

And now you must begin to make your hills, and for that purpose get a strong ho, of a good broad bit, & cut or ho up all the grass in the borders between your hills, & therewith make your hills with a little of your mould with them, but not with strong weeds, & the more your hills are raised, the better, the larger, & stronger grows your root, & bigger will be your fruit: and from this time you must be painful in your garden, and ever and anon till the time of gathering, in raising your hills, and clearing your ground from weeds.

In the first year suppress not one science, & suffer them all to climb up the poles, & should you bury the springs of any one of your roots it would dy, so that the more poles are required to nourish the spring. But after the first year you must not suffer above two or three stalks to grow up to one pole, but pul down and bury all the rest. Yet you may let them grow four or five foot long, and then chuse out the best

best for use. As soon as your pole is set, you may make a circle low broad your hil shal be, & then hollow it that it may receive the moysture, & not long after proceed to the building of your hills.

And where you began, or where your Hops are highest there begin again, and pare again, & lay them to your Hops, but lay the out-circle highest to receive moysture; be alway paring up, and laying it to the heap, and with some mould untill the heap coms to be near a yard high, but the first year make it not too high, & as you pass through your garden have a forked wand in your hand to help the hops that hang not right.

Now these hills must the next year be pulled down & dressed again every year. Some when their hop bind is 11 or 12 foot break off the tops, which is better than they that have their poles so long as the hop runs: but if that your hop by the midst of July attain not to the top of your pole, then break off the top of the same hop, for then the rest of the time wil nourish the branches which otherwise wil lose al, it being no advatage in running up, to the stock or increase of the hop.

How to heighten your hills. When to break off the top of the hop bind.

Now we come to the gathering of the about *Margarets* day hops blow, and at *Lammass* they bell; but when your hops begin to change colour is a little before *Michaelmas*, but long before som wil turn & change & grow ripe; which howsoever the best way wil be to pul them, & not suffer the to shed; they are called Midsummer hops; let them not grow til the other be ripe, & as soon as the seed of the rest begins to change then get pullers amain, & as many as you can taking a fair season; & note, you were better to gather the too early thā too late.

When hops blow and bell, and are ripe.

Therefore for neatness sake, pul down four hills standing together in the midst of your garden, cut the roots pare the same plot level, throw water on it, tread it, sweep it, and make it far, wherein the hops must lie to be picked.

How to pull your hops.

Then begin & cut the stalks close by the tops of the hills, & cut the asunder that grow one into another with a long sharp hook, & with a fork take them down; you may make the fork & hook, one apt instrument with which you may shove off al from the pole, & carry it to the place. But I have seen, of late they carry pole & all to the place and pick them off the pole: strait fine poles is best for this way, but cut no more stalks thā you can carry away in the space of one hour aforehand; for
either

either sun or rain will offend when they are off the pole you must all stand round the floor, and speedily strip them in baskets; for it is not hurtfull though some smaller leaves fall among them.

Neatness about
them is very
good.

And clear your floor twice a day, & sweep it, & if the weather be unlike to be fair, they may be carried into the house in blankets, but use no linnen, it will stain to purpose. And if you pull them upon poles, then lay them upon forked stakes, & dispatch thē, be careful of wet, lest they shed their seed, wch is the marrow of them. When you have leisure take up your poles and pile them, & carry out your straw, & so depart your garden till *March* unless it be to bring in dung. And for the advancement of your Hop-garden, get dung into your gardē, & lay on some in winter for to comfort & warm the roots, your hills pulled down, & let your roots lye bare all winter season: your old dung is best, rather none than not rotten.

How to dress
& pruin the
roots in
Winter.

And in *April* help every hil with a handful or two of good earth when the hop is wound about the pole, but in *March* you will find unless it hath been tilled, all weeds; but if you have pulled down your hills, and layd your ground as it were level, it will serve to maintain your hills for ever; but if you have not pulled down your hills you should with your ho as it were undermine them round til you come near the principall, and take the upper or younger roots in your hand, and discerning where the new roots grow out of the old sets, of wch be careful but spare not the other; but in the first year uncover no more thā the tops of the old Sets, but cut no roots before the end of *March* or beginning of *April*. The first year of dressing your roots you must cut away al such as grew the year before within one inch of the same; & every year after cut thē as close to the old roots; those that grow downward are not to be cut, they be those that grow outward, wch will incumber your Gardē, the difference between old & new easily appears; you will find your old sets not increased in length, but a little in bigness, and in few years all your sets will be grown into one; & by the colour also, the main root being red, the other white, but if this be not early done, then they will not be perceived; & if your Sets be small, and placed in good ground, & the hill well maintained, the new roots will be greater than the old; if they grow to wild hops, the stalk will wax red, pul

it

Chap. 37. Reducement of Land to pristine Fertility.

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it down & plant new in their places. As for the annuall charge of the Hop-garden after it is planted, the dressing the hills, the alleys, the hoing them, the poling, and tying to the poles, and ordering the hops is usually done for 40. s. an Acre, & pulling, & drying, and bagging by the day.

The charge of festing & dressing hops.

And so I shall proceed to the drying of them, which may be done upon any ordinary kiln, with any wood that is dry, but not too old; or else good sweet Rie straw will do wel, but charcoal best of all.

How to dry hops.

They must be laid about 9 or 10 inches thick, and dried a good while on that side, & then turned upside down, & dried as much on the other side. About 12 hours will dry a kiln full, which must be followed night and day, & then laid up in a close room upon a heap together for a month if your markets will give way to frume and forgive again. When the stalk begins to be brittle, & the leaf also begins to rub, then the hop is dried sufficiently, but tread them not while they are hot, it will tread the to dust, & the either against *Sturbridge* Fair, or what other markets thou providest for, thou mayst bag them up as close & hard as is possible, either to 200 or 200 & a quarter in a bag, as thou pleasest, but the usuall bag is 200 & a quarter. And so I come to my third particular, to shew you the profits & advantages that are to be gained thereby. One acre of good hops may possibly be worth at a good market 40, 50, or 60 pound: An acre may bear 11 or 12 hundred weight, possibly some have done more, many ten, but grant but eight hundred, they are sometimes worth not above 1. l. 4. s. the hundred, and some other times they have been worth 12, or 14. l. a hundred, and usually once in three years they bring money enough. It is an excellent commodity if curiously & well husbandried. I know in common waies of opping a Gentleman hath made of two Acres and a rod 180. l. in one year; the same ground hath after it hath been improved let for 50. l. *per an.* to a Hop-master; nay I beleve I could easily presideet you with 100. l. that hath bin made of one Acre, & may be more. It is usually a very good commodity & many times extraordinary; and our nation may ascribe it unto it self, to raise the best Hops of any other Nation. The constant charge of a Hop-garden is usually known, men order and dress the at a rate by the Acre all the year. And this very way I fear not to make out my Improvements promised.

The sign when they are dry enough.

The profits may be made of hops.

Mm

CHAP.

CHAP. XXXVIII.

*Treats of the mystery of Saffron, and way
of Planting of it.*

Here is another very rich commodity wherein our nation hath the glory, & yet is a very mystery to many parts of it, they know not whether such a thing grows in *England*, & yet none such so good grows in the world beside that I have ever read of, & that

Best time for
Saffron.

is Saffron. Now Saffron is a very soveraign and wholsom thing & if it take right it is a very great advantage for price; it hath its ebbings & its flowings, as almost all things have, yet I would fain give encouragement to this Improvement also. I shall briefly give you the story of it; Good land that is of the value of 20. s. an Acre being well husbandryed, tilled & sitted, or worse land being well manured, & brought to perfect tillage will serve the turn, but the better, the better for the work. The season is about *Midsummer* which it is to be set, that being the season they usually take up, or draw their sets or roots and old store, when they may be had, & no time else. The land being brought into perfect Tillage the best way is to make a cool like a ho in operation, but as broad as six of the, it may be 15 or 18 inches broad, & with that they draw their land into ranges, open as it were a furrow, about 2 or 3 inches deep, & there place their sets

How to set Saffron.

or roots of Saffron about 2 or 3 inches asunder (which roots are to be bought by the strike, sometimes dearer, & sometimes cheaper, and are very like an Onion, a little Onion about an inch and a half over) and as soon as they have made one furrow all along their land from one end to another, then they, after that is set, begin another, and draw that which they raise next to cover this, and so as they make their trench, so they cover the other; they keep one even depth as near as may be, which ranges or furrows are not above three or four inches distance, that so a hoe of two or three inches may go betwixt them to draw up the weed, which being set and covered, it may come up that summer, but it dies again, yet it lives all winter, & grows green like Chives or small Leeks, and in the beginning of summer it dieth wholly the blade of it as to appearance, that so one may come & take a hoe & draw all over it, and cleanse it very purely.

Saffron as
green as a leek
all Winte.

purely and then will come up the flower without the leafe and in *September* the flower of it appears like *Crocus* that is blew, and in the middle of it comes up two or three chives which grow upright together, & the rest of the flower spreads broad, which chives, that is the very *Saffron* & no more, which you may take betwixt your fingers and hold it, and cast away all the rest of the flower and reserve that onely, and so they pick it, and they must pick it every morning early, or else it returns back into the body of it, to the earth againe, untill next morning and so from one to another, for a months space will it bear *Saffron*, you must get as many pickers as may overcome it before it strike in again at the very nick in the morning.

How to pick
Saffron.

It will grow to bear 2 crops and then it must be taken up, & planted new again, and then it will yeeld good store of sets to spare, which cannot be had no other way, it must be taken up at *Midsummer* and then set as aforesaid. And when you have got your *Saffron*, then you must set a drying of it, and thus you must do, make a kiln of clay, not half so big as a Bee hive, and very like it will be made with a few little sticks and clay, and serve excellent well, for this service, a little small fire of charcole will serve to dry it, and it must be carefully tended also.

How to dry
Saffron.

Three pounds of wet *Saffron* will make one of dry *Saffron*.

An Acre of Land may bear 14. or 15 l. of *Saffron*; if very good, but if but 7 or 8 l. it will do the work; And one Acre of it will be maninged with no great charge, I do not beleave it can come to 4 l. an Acre, it hath been sold from 20 s. a pound to 5 l. a pound. It is an excellent advantage and brings in at worst a saving bargain, but it may possibly be worth 30 or 40 l. an Acre; but if it come but to 7 or 8 l. it loseth not, so I have given thee a brief story wherein I would have been more large but having lost my observations upon it which I took when I was upon the very Lands, and received full satisfaction in every particular and member, or branch thereof, but as yet it hath not fell under my own experience, therefore I give the heads as I remember, as they were delivered unto me upon the place, though I have forgot many of them, to incourage to the work.

The Saffron
Country.

The *Saffron* Country is on one side and nook of *Essex*, and some part of *Suffolk*, and at *Saffron Walden*, and betwixt that and *Cambridge* is very much of it in their common fields, and

truly these Lands are but of a middle worth. I have seen as rich land again in many parts of *England*, but it is as I believe loamy ground and of a little faddish nature, it will require to be laid dry and sound, and the land it self must be very sound wholsom Land.

CHAP. XXXIX

Treats of the Plantation of Liquorish at large.

Proceed to another Nationall business, in the Plantation whereof we exceed all Nations, and that is Liquorish, our *English* Liquorish as we call it, not yet wrote of by any that I could ever see, is far beyond the Spanish small dry Liquorish or any other.

As for the use of it most of you know, but as to the profit & advantage, & the mystery of Planting of it but few understand, & fewer practise; but that I may be as open and full in the discovery of it as I can in this short discourse I have to make, I shall under these two or three heads formalize what I intend to speak.

1. Shall be to discover the best land to bear it.
2. The best way I can find practised to plant it.
3. The profits and advantages of it.

The best Land for Liquorish. The best Land to raise your Liquorish upon is your richest you can get or make, your warmest you can find out, the soudest and dryest that is possibly to be had, of a very deep soyl, you must dig and prepare your Land before you set, and it must be digged three spades depth, and two or three shovellings at the least, laid as hollow & light as may be: you may have it digged out of naturall Land if it be very rich indeed, that it will feed an Ox in a summer, it is the best for eight pence a rod at London, yea for seven pence and sometimes for six pence a rod, forty rods make a rood which is a quarter of an Acre, which comes to about 4 or 5 l. an acre & this is the main charge of all for three year there is no more unless it be a little hoing, which will offhand very fast. I believe it will not cost above 20 s. an acre more all three yeares both in setting and all the dressing.

dressings of it, besides the sets and Land: The sets being doubly treble worth your money; sets have been sold for 2 s. the hundred & more, sometimes are not worth above 1 s. a hundred, but if your Land be not fresh old Land, or extraordinary rich, & as rich as your best gardens are, it must be made so with soyles & warm Manures, horse-dung is excellent to be intrenched into the Earth, it both warms and lightens it, and makes it very fit for this service. About London is very serviceable Lands for it, & so is on any dry soyl whatever where it is rich enough & deep. Holland in Lincolnshire must needs be very good, many of the Marshes that are sandy and warm most excellen^t, that which bears this well, wil also bear your Madder-weed that rich commodity: I hear that Liquorish grows naturally at *Worsop* in Nottinghamshire and about *Pimphret* in Yorkshire, so also I heare your sparrow-grass grows naturally at *Moulton* within a few miles of *Spauldwin* in Lincolnshire, and so I proceed to my third particular.

Price of sets

The place where best lands lye for this use.

Which is the best experimented way of planting of it.

Having digged and prepared your Land, and a little raked and evened the same, you may proceed to the Planting of it, & therein you must endeavour the procuring of the best sets you can, and from the best and largest sort of Liquorish. The best sets are your Crown sets or heads got from the very top of the root a little shived down; be carefull of this, of very sound Land, for how soon soever you come to the water your Liquorish will check and run not one inch further, and having procured your sets your ground being cast into beds of 4 foot broad, all along your plantation, from one end to another by a long line, you may lay down a set at every foot along the line, which line may have knots or thrids at every foot, if you be so exact, and then a man come with a tool made a little flattish if you will, or roundish, of the breadth or bigness of a good pickfork stail, about half a yard long with a crutch at the overend, and sharp at the neather, and that thrust into the ground, it being made of wood or iron, but if flat an iron one will do best, and open the hole well, and put in the set and close a little mould to it, and so you may overrun an acre very quickly in the setting of it, and if it should prove a very dry time, you must water your sets two or three daies at first, untill you see they have recovered their

How to set your Plants.

If dry, water your sets

withe-

Time of plan-
ting.

The Runner
yeelds good
sets.

withered and wanness, and then the first year you may Plant your garden with Onions, Reddishe, or any sallet herb or any thing that roots not downward, and I am confident it will be better too, because it will prevent some weeding, and for the second it must be hoed and kept from weeds too, and a little the third; but one thing be very curious off, in the taking up and sudden setting thy sets, as soon as took up set again, but if you fetch from fer, then as soon as taken up, put a little mould and poss them away by horse back, and get them into the ground as soon as possibly, the delay of setting, spoiles many thousand sets. The seasons of planting is in the month of *Feb.* and *March* You may the second year take some sets from your own stock, but be very curious thereof, but the third year you may take what you please and in the taking of the Liquorish up, the best season for which is in *November* and *December*, then there runs from every master root, a runner which runs along the over part of the ground, which hath a little sprouts and roots or sciences, which will yeeld excellent sets, if they be cut 3 or four of them in every set, which may be about 4 or five inches long, which is also to be planted, and is as good as the crown set, also if it be any thing a moist time, you may take slips from the leaf or branches and set them; and they some of them will grow, but they may be set betwixt the other to thicken, lest they should fail.

There is abundance of Spanish sets come over of late. One *M. Walker* sells of them at *Winchester* house in *Southwark* *London*, but how good they be I am able to say little, but hear various reports of them, and therefore I will forbear, they are bought cheaper than English sets can be, but if they bring forth a small Spanish Liquorish I shall not much affect them.

When taken
up, and when
fold.
The advanta-
ges thereof.

The third particular is the profit & advantage may be made thereby which is very considerable, but it is also subject to the ebbings and flowings of the market. It must be taken up in winter, and must be sold as soon as taken up, lest it lose the weight which it must needs do, you may make of one Acre of indifferent Liquorish 50. or 60 l. and of excellent good, 80. 90. or 100 l. it is not of so great use as some other commodities are, and so will not vent off in so great parcells as others will, neither will it indure the keeping for a good market because it will dry exceedingly.

The Fifth Piece contains the Art of Planting of Rape, Cole-seed Hemp and Flax, with the severall advantages that may be made of each.

CHAP. XL.

Only contains the Discovery of Rape and Cole-seeds husbandry.



He planting of Cole-seed, or Rape-seed is another excellent good meanes for the improving land; the Coleseed is of late dayes best esteemed.

And it is most especially usefull upon your Marsh-land, Fen land, or upon your new recovered Sea-land, or any lands, very rank and fat, whether arable or pasture.

The best seed is the biggest, fairest seed that you can get, it being dry, and of a pure clear color, of the color of the best Onion-seed. Best seed.

It is to be had in many parts of this Nation, but *Holland* is the Center of it, from thence comes your good seed usually.

The season of sowing, is at, or about Midsummer, you must have your land plowed very well, and laid even and ing.

fine, whether upon the lay, turf, or areable, and both may do well, but your arable must be very rich, and fat, and having made your land fine, then you may sow it, and about a gallon of seed will sow an Acre, the which seed must be mingled, as afore was directed about the Claver, with something, that you may sow it even, and not upon heaps; the even sowing of it is very difficult, it grows up exceedingly to great leaves, but the benefit is made out of the seed especially. How much seed sowed upon an Acre.

The time to cut it, is when one half of the seed begins to look browne, you must reap it as you doe whear, and lay it upon little yelmes, or two or three handfuls together till it be dry, and that very dry too, about a fortnight will dry it, it must not be turned nor touched, if it were possible, When to cut it.
for

How to use it.

for fear of shedding the seed, that being the chief profit of it; about a fortnight the seed will be dry, it must be gathered in sheets, or rather a great ship sail-cloth, as big as four or six sheets, and carried into the Barn, erected on purpose, or to that place designed on purpose to thresh it that day; you must have sixteen or eighteen men at a floor four men will thresh abundance in a day. I have heard that four men have threshed thirty Coume in a day.

The seed is usually worth sixteen shillings a Coume that is four shillings a bushell, sometimes more, and sometimes less.

How much an Acre may bear

It will, if exceeding good, bear ten Coume upon an acre, or five quarter; if it be but indifferent, and will not bear above seven or eight Coume of an Acre. It will raise a good advance upon your lands.

It is a commodity you will not want sale of, the greater the parcell is, the better price you will have. It is used to make the Rape-oyl, as we call it. The Turnep seed will grow among it, and it will make good oyl also, you may sell a thousand pound together to one Chapman, it is best to be planted by the water, or near it.

It cannot be too rank, the Eadish or Stubble will exceedingly nourish Sheep in Winter.

It hath another excellent property, it will fit the land so for corning, for Wheat it may produce a crop as good, or better than it self, and for Barley after that.

The charge of an Acre.

The charge of the whole Crop, I conceive may come to be betwixt twenty and thirty shillings an Acre, and a good Crop may be worth four, five, six, seven, or eight pound an Acre, the least is a very good improvement, because it will doe excellent well, if well ordered, and a kind season upon land the very first year after recovery, when it will do nothing else, if it can be but plowed, when other things as corn or grain may be hazarded; and so have you this Discourse, though in much brevity; your experience will teach you what euer here is wanting, and my weighty business will not suffer me to supply.

*Shewes how good a publike Commodity Hempe is,
with the mannar of planting.*

CHAP. XL.



S for Hemp, that is a very good Commodity, and would be farre the better, but that it is not mad so Nationall, yet as necessary I am confident, as any thing amongst us is yet; but not being intended, nor encouraged, as a staple or grand businesse as it might, and Flax also, and that more especially then this, but both joyned together, and a publique stocke erected, either in the general, or else in every particular Township; I know not but why the product thereof might not onely bring in a constant considerable profit for the stock, A design to see all poore to work, and well maintain them. and the poore in every Parish maintained, both comfortably in a calling and livelihood, especially all women kind, and children, but they fitted and brought up to a Trade and way, that may render them publikly usefull to the Nation. I should undertake to make it out, that this very way of it self would do it, if it would advance the work, Why should we runne to *France* and to *Flanders*, and the *Low-Countries*, and I know not whither, for thred and cloath of so many sorts, and fine linnen; and cordage? or rather, why should we not, if we be at want of Work-men to make out to that worth and goodnesse, fetch here and there a workman from thence, and so preserve, or rather raise the Trade wholly within our selves, had we but Law put in execution to constrain people to labour, and some way to perswade men to use their Lands to the best advantage to themselves and publike, what should we want? We have the Commodity grows exceeding well among us; we see we have and can make excellent good cloath, better for use then theirs.

Object. You will presently say, we want Work-men, especially such as do it well.

N a

Answ

Ans. To that I shall answer, people wee have enough you will confesse it, and some that can worke well too where is the fault then? I being not a Tradesman can scarce tell you, but only will desire an answer to this question: and then it may be I shall resolve you: what hath made cloathing common among us? and made Worke-men at it too, but the very Trade of it, the experimenting of it to purpose, the carrying it on with power and purse, that by this meanes, where ever it is planted, there needs no work-folke, they are ready to come from all parts where work may be had, then that is supplied. It is true, at the first setting up, people are raw, untaught, and not very willing to learne, and may be (as ever it was,) in all new inventions, or setting up new works, you may suffer some losse and spoyle; yet if this be backed with publike countenance, and authority; I feare not any suffering at all, but if you should, you are but in the condition of all honest, publike ingenious spirits.

And secondly, I shall answer, that nothing ever did, or will come to perfection without great experiences, constant practises, and great scrutiny into the bowels of it, and that will draw forth the mystery, and that is the profit and glory of all Trade and Merchandise, and then why we should not make fine cloath, and almost any cloeth of our Flax, and raise our Flax to a great betterment too; I know not; I could name many things in *England* now, are made as good with us, as few yeares since wee could not, but were made altogether beyond seas, and we supplied from thence; but grant wee raise not so pure a Flax, then buy your Flax from the East or West Countries, endeavour the Trade of making your finer cloath thence, and your coarser from our own, untill our Flax come up to theirs in goodnesse, which I am confident will refine exceedingly, both in the growth and workmanship of it; however use all meanes to preserve the Trade of cloathing Linning, so far as our owne native Hempe and Flax will: I have heard of most pure cloath some Gentlewomen have made of their own flax, and Hemp.

I shall now proceed to a brief description of the way of raising it. As for the seed of it, that is familiarly bought and sold in all places in the season, but the best seed is your seed, brightest, which you may try by rubbing of it in your hand, if it crumble with rubbing, it is bad, but if it still retain its substance and colour, it is good.

The best land for it, is your warme land, your sandy, or Best hemp-a little gravelly, so it be very rich and of a deepe soyl, will land. doe well, as for your cold claires, as some affirme to bee good for Hempe, they exceedingly abuse the Reader, it is as tender a seed as any I know, and to make good my affirmation as to the land, consider the land where the best Hempe of England grows, which is upon the Fens and Marshes, and especially in Holland, in *Lincolshire*, where the land is very rich, and very sandy and light, but their morish land, though rich, is not good, and yet the very best land they can pick there, is but good enough for it, yea that very land they are forced to dung and soyl exceedingly too, after two or three crops, or else it will nor doe; Nettle-plot, and Thistle-plots, and land overgrown with the rankest weeds, if well purged there-from, will doe exceedingly well for Hempe.

The quantity that is to be sowed upon our Statute Acre is three strike bushels, and harrowed in with small harrowes, the which after the land is made exceeding fine as the finest garden, then in the beginning and middle of April is the time they sow it, some sow it not till the end of April, but if it be any thing a kindly year, the earlier the better, and so preserved exceedingly choicely at first, for feare of birds destroying of it as you see in many Countries, but yet there where they sow so much they never value it, bee careful that cattel neither bite it, nor lie upon it, for though some say it matters not for being kept from Cattel, so they may save the fencing of it, yet I say if it be either bitten, or else but a beast lye upon it, after it is come up, it will destroy it.

The season of getting of it is first about Lammas, when a good part of it will be ripe, it may be about one half, that

How to know the best hemp-
The quantity, the time of sowing of it:
It must be fenced.
Times of getting it.

is a lighter Summer Hempe that beares no feede, and the stalke growes white and ripe, and most easily discernable, which is about that season to be pulled forth and dried, and laid up for use, or watered and wrought up as all house-wives know, which you must pul as neatly as you can from among the rest, lest you break it, for what you breake, you utterly destroy, and then you must let the other grow for seed untill it be ripe, which will be about *Michaelmas*, or a little before, may be a fortnight before (when seed and stalke are both full ripe, and you come to pull, you bind up in bundles as much as a yard band will hold, which is the legal measure; but for your simple or Summer Hempe, that is bound in lesser bundles, as much as may be grasped with both your hands; and when your Winter Hempe is pulled, you must stocke it up, or baine it, any way to keep it dry, and then in the season of the yeare, or when you please, thrash it, and get out the seed, and still preserve your Hempe till you set to the working of it, which instead of breaking and tawing of it as they doe in most parts, there they altogether pill it, and no more, and so sell it in the rough; but I leave all at liberty for that, whether to pill or dresse up by brake and Tewtaw.

What seed is worth.

As for the seed an Acre will beare, is two or three quarters; and it is there sold but usually about a mark a quarter, sometime ten shillings; and sometime less; this yeare it was sold for twenty shillings a quarter, if good great Hempe, then store of seed, else not; but in many and most parts of the Nation it is sold for about four shilling a bushell.

Your simbled Hempe is not worth above halfe so much as your other, sometimes it is subject to weeds, to earlock and muckel-weed, which must be weeded, but the best way to destroy them, is to let your Hempe-land lie one yeare fallow, I onely speake of *Holland*, the cheapest place for it and the first fountain of it, but generally throughout the Nation, it is of far more worth and value.

The best land for Hempe.

The richer your land is, the thinner, the poorer, the thicker, you must sow. One Acre of good Hempe may bee worth five, six, seven or eight pound an Acre, & sold as soone

as pulled, and gathered; but if it be wrought up, it may come to eighr, nine, ten, or twelve pound, or more, it is a common thing in use, every one knowes the manner of working of it to cloath.

It maintaines many people in a good imployment, and ought to have more publick incouragement given to it, not so much becames of its advance of land, as the poor poople of the Land.

CHAP. XLI.

Onely speakes to the husbandring Flax so as to make it come up to as much of the improvement as we can.

Flax, it is a very good Commodity, and I shall endeavour to incourage all ingenuous men, that delight in the common good, thereto, as much as may be; especially all such as have suitable lands therefore, upon this account, because it is, as I may call it, a root, or roundation of advantage, upon the prosperity whereof, depends the maintenance of thousands of people in good, honest, and laborious callings: and were but this very peece of husbandry advanced, the sowing and raising of it, according to the capacity the lands of this Nation will affords, I dare asseme to hold it forth against the stoutest opponent; that it would maintaine neare all the wanting people of this Nation. A volume is too little to containe this vast Discourse; yet take an abstract of it, which for the more methodicall demonstration, shall be held forth under these heads.

1. The severall Lands capable of improvement hereby.
2. The many people capable of imploymen hereby.
3. The best experiences of plantiug and raising to the best advantage.

4. The profit accruing there from both general and particular.

First flax Land.

3. 1. given for flax Land.

1. As for the land capable of raising good flax, is any good sound Land, be it in what Country soever it will, if the land be good, either earthy or mixed of sand or gravel, and old land, it is the best, that hath lyen long unplowed, it had need come up to the value of a mark, or near twenty shillings an Acre, that is your kindest flax-land, but I know where they give three pound an Acre to sow flax upon, within a mile of *London*, and yet in most Counties of *England*, I know as good and kind land for that husbandry, as any other, and at *London*, they have work-men dearer too, and yet can raise (though they give so dear) a very considerable profit out beside.

Again, any of your good Arable; that is in good Heart and rich, that is perfect sound drie land, is perfect good flax land. Some parts of *Essex*, from *Bow* and *Stratford*, down along the way, by the *Marsh side*, a great part of up-land thereabouts, is good flax Land; so is there very much in *Kent*, all along on the other side the River by the *marshes side*, is good naturall land thereto; in very many parts, about *Maidstone* in *Kent*, where the best thread is made of *England*, is excellent good flax-land: so is there also in most Counties, as *Warwick-shire*, *Worcestershire*, *Northampton*, &c.

The several persons that flax imployer.

2. And that I may give the more encouragement here to spin, I say, as heretofore, it is a commodity that will set a bundance of persons upon an honest and profitable calling, from the first preparing the land, untill the fruit of your labours come in; one acre of good flaxe may maintain divers persons to the completing of it to perfect cloth. Consider how many Trades are supplied hereby.

1. The Land must have the same husbandrie of plowing, harrowing and sowing, as lands have for corne, there's the husbandmans businesse, sometimes, yea many times weeding too, then pulling, stitching and drying, then rippelling, and laying up and preserving the seed, then watering it either on the ground, or in the water, then drying it up, and housing it, and kilne-drying it, then breaking and tow-
ing

ing it; then hutchelling and dressing it up; then spinning of it to yarne or thred; then weaving of it, and bleaching, then it returnes againe to the good house-wives use or Seamster, and then to the wearing and usage, and all these particular employments be upon this poore businesse, halfe a dozen good callings and employments this makes out, and therefore many persons it will imploy, and we both want cloth, and our poor work.

3. Now as to the carrying on this design, and making the best of this improvement, I shall here give in the best approved way of planting of it, as is yet discovered; as for the Land, let it be good and well plowed, both strait and even, without balkes, and in due season, about the beginning of *March*, or the latter end of *February*. How to raise the best flaxe.

And as for the seed, the true East Country seed, is far the best, although it cost very dear, one bushel of it to sow, is worth ten bushels of our owne Country seedes; but the second crop of our own, of this Country seed, is very good, and the third indifferent, but then no more, but again to your best seed. Best flax seed.

The quantity of it is about two bushels upon an Acre at least, some sow a pecke more; but I conceive two may bee enough, but of our seed it will require halfe a strike more then of the East Country seed, you may buy it in the Seed-mens shops at *Billingsgate*, our Flax men in former dayes did not sow above half so much, or little more, but now their experience hath brought them to this pitch.

At my first knowledge of the East-country flax seed, for the perfect discoverie of the goodnesse of it, I sowed one land, the ridge or middle of the Land with our own Country seed, and both the furrowes with this Dutch or East-country seed, our seed was incompassed with this, as with a wall about it, it so much over-grew it in height. An experiment of both sorts of seed.

The season of sowing of it, if a warme season, in the latter end of *March*, but in the warmer parts, as *Essex*, and *Kent*, I conceive mid *March* may doe well, but in colder parts, as down towards *Warwick-shire*, and *Worcester-shire*, the beginning of *April* may be early enough, and if it should The season for sowing flax.

should come a very wet season you must take care of weeding of it also, and in the ripening of it, you must be careful, that it grow not till it be over-ripe, lest the stalk should blacken or mildew, yet to his full ripeness you must let it grow, the which you may perceive both by the harle, and by the seed; some will ripen earlier, and some later, as you sow it earlier or later, but against it be ripe, be sure to have your pluckers to fall in hand with plucking of it, and then tie up every handfull, and then set them up upright, one against another, like a Tent, till they be perfectly drie, and then get it all into the bairne, or where you please to preserve it for use, it is indifferent whether you ripple it, or take off the boles of it, as soone as you bring it home, or when you intend to use it.

The manner
of watering
of it.

As for your watering of it, whether in the water or upon the Land, that I shall not determine peremptorily, but thus much I say, that both may doe well, and he that gets store, will find use of both: because of the one, you make use as soone as your flax is pulled, and then you need not stand so curiously upon the drying of it, but after you have got your seed, you may water it, and the watering of it, opens, and breakes the harle the best; but then you must be carefull of laying up your seede, that it heate not, nor mould, and that which you water then, may be a winters worke for your people untill the Spring come on, and then get it forth upon your grasse Land, and spread it thin, and turne it to preserve it from mildewing, and keepe it so untill you finde the harle bee ready and willing to part from the core, and then drye it up and get it in for use.

As for the drying of it, a kilne made on purpose is best, so that you be carefull of scorching of it, this will make greate riddance of the same, and to them that have greate store, sunne-drying will never doe the feate, though it may doe well for a small quantity, or the flax of a private Family.

As to the working of it, you must provide your Brakes and Tewartawes both, the one, and that is the brake

brake which bruises and toughens, the harl, and the Tewtaw that cut and divides out the coare, if you use the Tewtaw first, it may cut your well dried flax to peeces, yet both do best, yet the brake first.

These things are common and known to many in most Countries, but not to all, and least to those that have lands most capable thereof.

It will cost the Workmanship of it, betwixt three and four pound an Acre to bring it up to sale, it lyeth much upon the workmans hand, and therefore far more to be advanced; by how much the more it raiseth employment, for many people to live thereby.

The charge of the flax from the beginning till it come to the Market.

Where wages is great, it comes off the hardest; yet where it is carried on to purpose; people flock hard that want work, and because of constancie, will worke at easie tearms, else how could they possibly do good of it at *London*, or near about it, where they work at double rates, but there have I seen the best flax I ever saw.

4. Lastly, the benefit that may be made hereby, an Acre of good flax, may be worth upon the ground, if it be the first East-Country seed, seven or eight, yea, possibly ten or twelve pound, yea far more, the charge whereof beside the seed, untill it be ripe, may not be above ten shillings an acre, which if you work up to be fit to sell in the Market, it may come up to fifteen, or sixteen, or near twenty pound in the market, but to bring it so high, as thirty pound, as in *Flanders*, I dare not say.

But an acre of our Country seed, will hardly come up to above three pound or four pound an Acre; unless very good indeed, to which if it amount unto, and no more upon the Land, it will make a good advancement of the Land, which may be, Land, and Seed, and all charges, may come to about fifteene or sixteene shillings an Acre, the seed being not worth above two shillings a strike.

I shall say thus much more, that I verily believe wee are not come up to that perfection, wee may attain unto in this mystery, because I have heard of some Gentlewomen that

The flax and
Hempe-trade
not come to
perfection.

have out of their owne Flax and Hempe drawne out a third exceeding pure, as pure and fine againe as our ordinary Traders therein doe, and have made as much more cloath of a pound of both, and that both strong, and more serviceable, then the strongest and best Outlandish Hollands; and I am confident, if this mystery doe but receive encouragement from Authority, and it made more tending to publike good, the maintenance of the poore in worke, and sequestring the Trade so farre to our owne proper Natives, as may be a sufficient Magazine of work for them. I am sure we have land suitable enough to bear it, and to afford sufficient profit, and will be a considerable advance unto the lands throughout the Nation.

And so I hope I have supplied in some measure, more of our deficiencies that really are, and are said to be in our *English Husbandry*.

The

The sixth, and last Piece of improvement is for the discovering what great advance may be made upon our Lands by a Plantation of some Orchard-fruites, and some Garden-commodities.

CHAP. XLIII.

Treates how our Lands may be advanced by planting them with Orchard-fruites.



And for making good the Improvement promised, I shall shew these two or three things. 1. That abundance of Land is planted in many parts of this Nation, and thus improved. 2. That there is land, and very much, in all other parts that may be improved. 3. The fruits especially, by which they come to such an improvement.

1. That there is such land already improved, none dare deny; to that height as is affirmed, many will question: I therefore doe in brieffe affirme for my president, that, *Worcestershire*, part of *Gloucestershire*, and part of *Hertfordshire* will speake out this truth, some men having their Plantations, both of Apples, Pears, and Cherries, and so ordered that they hinder no more the growth of grasse then the compasse of a tree that grows upon it; nay, some question whether with their shadiness in Summer, and warmness in Winter, they better not the land farre more, and their very growing

What parts
prove the im-
provements.

upon it doth not enrich it, they having usually the earliest grasse, and many times the greatest swath and burthen, and will keep more cattell too. And certainly where they are formerly planted, and grow not too thicke, I cannot see reason to the contrary; as for the land, I know very much, if not most of it, was worth, not above tenne shillings, some lesse, or thirteen shillings foure pence an Acre at the first, now the grasse of most of them thus regularly planted, and draw as they grow in bignesse (that so they may never grow to touch one another by a good space, when they come to the best age, for when they come to decay, plant new ones in their roome, and downe with them to the very ground (I say the grasse of such Orchards or Pastures is worth thirty shillings, some forty shillings, some fifty shillings, and some more, and the fruit that groweth upon the Trees planted therein, may yeeld some three pound, some five pound, yea, some will come up to seven or eight pound an Acre.

What Nurseries of young Trees may improve.

But come you up to *Kent, Essex, Surry, Middlesex*, and part of *Suffolke*, where naturally the land was worse then in those parts by farre; I dare affirme there are many Orchards planted there upon land, that was not naturally and really worth above six shillings, or eight shillings an Acre, when they began the work, and that some thousands of Acres too, and with some good soyle, and good husbandry, dividing, quicksetting, and laying dry and sound their land, and gardening some, and planting others with kernels of all sorts of fruits, and all sorts of woods; and sets, and trees, have brought many plots, some containing five or six acres, some to ten, or twelve, and some to twenty, or thirty acres, in one plot, to that improvement that they have made twenty pound an acre, yea, if I should say forty or fifty pound, I should finde sufficient testimony to the truth hereof, and all this while but in preparation for a plantation too, their young trees being not come yet to beare, nor to shade the land, and then they lay it downe to grasse, but say the land was worth twenty shillings an acre, and some is, and very much worth more, which is so much

be.

better it will prosper, and so much lesse cost need bee bestowed, and yet by all, will be made good the improvement promised. These Orchards many of them are worth to grasse forty, fifty, or three pound *per* acre, and so set; their fruit will seldome yeeld them so little as double or treble the worth of their grasse; many times five or six fold, yea, possibly ten fold, and what is this towards the making good my improvement promised.

If this land was not worth above six or ten shillings an acre, as very much was not, then it is fourfold doubled in the grazing, and if it treble in the fruit, then there is sixteenfold, and if it come up to sixfold in the fruit, then there is twentyfold by Orcharding. How land is improved to twentyfold by Orcharding.

I will go no higher, but I might, and many doe and will, the cost bestowed; for the two, three, or four first yeares may be as three or foure pound an Acre, may be five pound, but then the Garden fruits which they raise upon them, the sets, the grafts, the trees, and fruit they raise upon it, may bee possibly worth as much more as it is worth, when it comes to be laid down to grasse, but then it costs no more then mowing their grasse, and gathering their fruit, and yet during the flourishing condition of this Orchard, it shall hold forth the improvement aforesaid.

Object. But some will say this may be true in some few Acres, and by some few excelling husband, but in very few persons, and upon few lands.

Ans. If any, why strive not others? after the same pitch, why runne not others to the same mark? if one Acre, why not two? if there be one so good a husband, why imitate wee not him? wee know one man may have as good meanes to the same end, as another. If one Tradesman get an excellent commodity, or attain to an excellent mystery in his Trade, do not all men study it, thirst after it, and endeavour it, and may gain it. One land may improve as well as another.

Object. You will say our land is not so good, there is little such, and most lands in England are not for that use, and in some Countries little or none at all.

Ans. To which I answer, neither was theirs as good, or knowne to bee so good (and that is all one) untill they made

Very much
land may im-
prove as well
as that which
is improved.

Object.

Answer. 2.
The natured
lands upon
which the chief
fruits doe
grow.

made the experiment. It is but very few ages, since these Countries have been so famous; every age hath exceedingly improv'd, and this very last age as it were almost doubled what former ages came to; and truly when you have made the same experience, you will finde your Land as good, and by good husbandry with a strong resolution to the same end, will bring forth the accomplishment of the same fruit; and so I shall proceed to an answer of the second part of the objection, which is, there is little such land, or little fit land for this use in many Counties in *England*, which brings mee to my second particular, which is to shew that there is land as well in all Countries, and Counties, as those lands of *Kent Essex, Surrey, &c.* and very much in many, where is no improvement at all made thereon; and that I thus demonstrate, by inquiring into the nature and qualifications of these lands, and these lands are many of them exceeding dry, sound, warme lands, some perfect land, some gravelly, some of a very shallow mould, not above halfe a spades pitch before you come to hunger and barrenesse, some exceeding stony, some of them are upon a very rich soyle, as by the Marshes sides, some of them are upon a cold, spewing wet, clayey land, but made rich, and warme by soyle and husbandry, and some upon a perfect clay, cold and barren; and yet upon them all, you have exceeding great advances, as aforesaid.

Ans. 3.
Lands of the
same nature
may raise the
same improve-
ment.

Object.

And that there is some such natured lands in all Countries, and in some all these natured lands directly, no man will deny, and also meanes and soyles to enrich them, though not so much; but yet I am sure many times more then is improv'd to so good an advantage and more may be made, and gained to enrich them, if wee grow industrious. And now that I have proved there is such natured lands, what remains to cleare the full demonstration, but that as great advancement may be made in those Countries, as in these.

Why this remains, that they are not under so warme a Climate, as those Lands are, which is true, and this is all that can be said, to which I answer,

1 *Ans.*

1. *Ans.* That the climate is much to the drawing forth these fruits, and especially to the drawing them forth to early, but yet not sufficient excuse to hinder the work, for then why should *Glocester-shire*, *Worcester-shire*, and *Hereford-shire* be so famous; I am confident they are as natural and as fruitful this way, as these Countries are, only I beleive they are not so quick for sale, nor so early ripe, may be by a fortnight of dayes, which is nothing.

The climate
but a very small
hindrance.

And the climate is as cold in these Countries, as in almost any, except two or three of the Northern Countries, in which Countries are very much good fruits, and many good Orchards too, and why not more I know not, I doe confess Cherries grow upward, more rich, early, and more profitably, then in other parts, yet *Worcester-shire* comes near them, but what if they come not up so high? they may come up high enough, and wee see they will grow well, and to good profit in other parts, as well as here. But say there was not a cherry growing in any of those parts: I should not much matter, they being only for delight and pleasure, yet if good Peares for Perry and Aples for Syder would prosper well, which I am confident they would, if industriously experimented, which would be for the great supply of the poor, & the whole Countrie for every Town & House almost hath an Orchard bigger or lesser, that doe, and will bear both Apples and Peares of all sorts whatsoever, and all Countries have Lands naturall therefore, as well as these, where there is so great improvements made, and therefore I know neither nature nor reason against the same, nor nothing else but ignorance, sloth and prejudice, and so farre as I know, or I beleive any man else knows, there is Land enough in every Countrey suitable hereunto, however to make a very substantiall and gallant improvement, if not altogether so great as these. And as for the sale of them, or Perry, or Syder, we need not much trouble our selves, nor hinder our improvements thereby, untill our selves, our Neighbours and the poor about us are supplied, and then, when wee have it to spare, to sell it; it may bee transported much by water, and many places by Cart to places of

Sloth and ignorance the
greatest hindrance of im-
provement.

vent,

vent, whereas some of it, & that most excellently made, (these dayes will teach us) may be sold for Wine, & in thousands of places now it is; & serves as well as that, for men to fox their noses, befool themselves, and wast their patrimony. And so I hope I have sufficiently proved the capacity of advancement of many thousand acres of Lands, upon this account; yea the great advance might be, if you planted but all your barren & empty hedges with good fruit Trees, and so I descend to my last particular which is.

Thirdly, the speciall fruits I intended and they were these five: 1 the Vine, 2 the Plumb, 3 the Cherry, 4 the Pear, and 5 the Apple.

First, As to the Vine & Plumb, I intended not them directly upon this account, as to the great advantage their plantations would raise Lands unto, because they would be confined to lesser quantities of Land, but chiefly to shew the advantage might be raised through their own plantations.

That Wines
may be made
in England
feasibly.

And for Vines in relation to themselves, I did intend a large discourse, whereby to have presumed to have raised a publike experimenting of them to this effect, as thence to have raised good and usefull Wines which that it may feasibly be done (in this season of Wines dearth) I have these two grounds.

1 Because the South-west parts of *England* are within one degree South of the Northern parts of *France*, as *Bramont*; yea the very Latitude of *Paris* it self is not two degrees South of us: but,

Secondly, and chiefly, because it hath been made already in many parts, as in divers places in *Kent* and *Surry*, & many other parts, as old Chronicles report, & that frequently, & may unquestionably be raised, in case we fail not in the advancement of the Plantation, but hit that right; But for a weighty reason hereafter discovered, I shall say no more.

But for the three last, the Cherry, Pear & Apple, I had absolutely resolved to handle them at large in the whole mystery of them, both in Setting, Planting, preserving, pressing, barrelling & Merchandizing of them; to clear up the great advantage Lands may be raised to by their Plantations; but that in this very interim, whilst I was about the very work, Mr. *Samuel Hartlib*, that

that publike spirit, sent me in this assurance, (with his desire that I would not publish it to the world) that an *Oxford Gentleman*, called *Ra. Austen*, an Artist both learned and experienced, had finished a Work fit for the Press, of approved experiments in Planting late Fruit, from better Rules than have hitherto yet been published, of which taking notice, I was most willing not onely to publish, but (to imbrace the tender, upon a double score.

First, my own, and secondly, the publike advantage,

1. My own advantage is great (being tyred out with journeyings & travels, to evidence my experiences the more candidly to the world (to be ceased from the writing thereof, by one better able to hold it forth, having made it his Master-piece, both of study and recreation: A brief discourse wherof would have made a considerable Book.

And Secondly, upon the publike advantage too, who hereby are like to communicate in a more full and copious discovery of the Art and Mystery thereof, from him that hath ingaged singlely in this business rather than from my self, that could but confusedly, and not have been so large and full as he may bee: Besides, this pregoing piece of mine (though possibly of little worth) might have stifled a better & larger in the birth upon a discouragement, lest the free sale thereof might in some measure, have been retarded hereby. I therefore durst not neglect to receive the motion with most reall, and candid imbracings.

CHAP. XLIV.

Shall containe a brief discourse of some choyce and more generall Garden Fruits, intended to have been spoken to more largely.



N D they were six, 1 the Cabbage, 2 the Carror, 3 the Onion, 4 the Parsnep. 5 the Artichoak, and 6 the Turnep.

In the discourse whereof I should have spoken distinctly as I could, and have laboured to have laid naked the Mystery of each of them with the best

and latest husbandring of them according to use and exercise of our now present art of Plantings, but expecting it more large in all the members and branches thereof from so learned and experienced a hand, who undertakes the task, the art of Planting singly of it self, I shall hope to have discharged my promise, better by my silence, then in holding them forth under so brief, and confused discoveries, as I have done many other in my foregoing Discourse, and should for want of time been forced to have done these.

And so I shall conclude all, and my whole Discourse with a few words to my main scope and aime, which is to affirme and prove, that by these Plantations, Lands may come to a very great advance; yea, unto as great as the greatest that is affirmed in my Frontispiece, but yet never to that height, as some have fondly imagined, and doe affirm in word, and have done in Print, they can raise land to, many whereof are from severall sorts of Garden-commodities, as from some of these, and from the great million Pomproot, which I least matter to own of all the rest, I being once so weak as to come to an agreement with Mr. Speed, who writes such high things, as reason cannot fathom, to discover his particulars to me, which he gave me in writing, some whereof were some of these Garden-commodities, and another the planting of Conies upon hard land, all which (except the Pomproot) were as well knowne before to my selfe, as to him, but not, that from them to raise so great advantages, I never knew, nor shall: and some other things, he told me of, as laying up coals at *Newark* in a dear time, which I fear the Merchant hath found out that, and to keep them till they grow scarce, and ingross them, and hold them up to an exceeding price, but of the manner how this must be done, and some few other things, promising him not to reveal them to others.

I will say no more; for in regard I never phascified them, I have forgot them, and so shall leave my Reader to search for them from himself as well as I, who certainly now must
needs

needs have made more full experiences of them, it being near two year since I had first acquaintance with him; but the aforesaid being my own as well as his, and all mens as well as ours, I shall make bold to discover them to my intendment (for as to his I shall never attain) and that is to incourage their Plantations, because Lands may be highly advanced by them; and when thou hast the Art of planting dismysteried to thee at large, as will be very shortly, fall upon them.

And because Land of great quantities cannot be advanced to that height, as lesser parcels, which are within the power and purse of the Gardener, which with his constant paines, watching, toillings, hazards and adventures, he may make one hundred pound possibly out of some one Acre of Land, if his commodity prosper well, as some have done; but in the case of non prosperity, some are half undone again, as if it thrive not exceedingly in the growth, prosper not as well in the ripening, escape frost, and thieves, and meet not with a good market, what it will come to then I determine not, neither doth Mr. Speed consider of these things, and how then it would do, when thousand of Acres should come to be planted therewith I know not, I shall leave it to him to resolve, and onely take out Turneps, mainly intending my design, which will be sowed at small cost and charge, and grow upon indifferent Land, and bring forth great increase, and are of more generall use: and in case much Land be sown therewith, and they come to so great plenty, that the Markets will not carry them away, at such a proportionable rate, as the Gardener can afford them, then may they be disposed of, to the feeding of sheep and Cattel. which they will doe, and to good advantage too, and in a dear year, to make bread thereof, half meal, half boyled Turnep, mixed and wrought together into dough, and kneaded and made into bread, will make a good and delightfull food, as hath been by many experimented already; yea, as Sir Richard Weston affirmed to my selfe, he did feed his swine with them, though all men hold the contrary, that Swine will not eat a Turnep, (so I say too) no more than a Scot will

Charges, and hazards in gardening cuts the comb of its greatest hopes.

How Turneps will help out the improvement though Markets fail. How Turnep makes bread in a dear year.

How Hogs
may be kept
and fed with
Turneps.

Swines-flesh, yet the boyling them at first, and giving them to his Hogs in good wash, and afterward all boyled, that at the end they came to eat them raw, & would run after the Carts, and pull them forth as they gathered them.

What Turnep
seed sows an
Acre, and how
to order it
throughout.

So that upon these accounts, and because I know it will bring Land to a good advance, as unto 8. pound, 10. pound, or possibly 12. pound *per* acre, I propose this especially; but for the fuller discovery hereof in the myserie, I leave that to be more fully discussed in the Art of planting, and should that fail of seasonable coming forth, or of a full discovery, it is but about eight or ten quarts of seed sowed upon an acre of dry sound land, indifferently rich land, well plowed, digged and harrowed, as for corn, and then after sowed thin, and even with some composition with it, & then slightly covered with a bush, some sowed early, where the land will do, & some late, when other crops are off, & selling them, or spending them at a Market-price, they will bring forth the advantage promised, and so I have indeavoured to supply this deficiency in husbandry, also in some poor measure the want of improving our garden-fruits, our Lands being as capable of improvement this way, and as high as is by their Brabant husbandry, and so am come to my desired end at last, all which I commend to thy patience, and thy self, and into the word of our Lord Christ his blessing.



A.

**Table of the most principall Heads
and branches of this Discourse, as they
are laid down under the severall main
Peeces of the Book, and illustrated in
that Chapter discoursing each par-
ticular Peece.**

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*Sheweth the antiquity and necessity of Hus-
bandry.* pag. 3, 4, 5.

Chap. II.

*The causes of barrenness as they are in
men.* 6, 7, 8.

The causes of barrenness as in the land it selfe. 9.
to 14.

*The first Peece contains the 3, 4, 5, and 6 Chap.
Treating of the Remedies against Barrenness,
and particularly of Floating and
Watering Land.*

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*Sheweth what Land lyeth best for advancement by
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Of impounding water upon land, & in what case. 18.
of

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Of what nature the best land for watering is. page 19.
20.

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to proceed. 21.

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The advantages of watering land. 25.

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How to prevent heaping of the earth in trenching. 28.

The manner of levelling land by the plough to water. 29.

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To level by spade, and what a man may do a day. 30.

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What makes a bog, and how to carry a drain. 34.

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The great prejudice by crooks and angles in water-
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A Table:

Floating a bog best destroyes it. pag. 37.

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The cure, or best and speediest way of reducing drowned lands unto perfect soylmanes. 53.

The best way to improve drowned lands. 58.

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The Trenching Plough. 67.

The Turning Spade. 68.

The Trenching Spade. ibid.

The Paring Spade. 70.

The use of the Paring Spade. 71.

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Sheweth to inclose without offence, & prevent depopulation that is most common, attendant and appurtenant to enclofure, & how to make severable Errable, comon field Lands, & comon Heaths, Mores, Forrests, Wasts, to every particular Interests, & the Comon-wealths great advantage

Chap.

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Treateth of Improving Land by Pasture; Reproves Depopulation, proves excellent Advantages by Inclosure, and taketh away the usuall Scandalls laid upon it. pag. 72.

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103.

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108.

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121.

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122.

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and Ingredients to be compounded
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ture and use of them.

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4. The planting of Hops, Saffron, and Liquorish, and the profits thereof.
5. The planting of Rape, Cole-seed, Hemp, and Flax and their Increase.
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